AD-A197 419

INSTALLATION RESTORATION PROGRAM
PHASE II - CONFIRMATION/QUANTIFICATION

STAGE 1

APPENDICES FOR FINAL REPORT
FOR

UNITED STATES AIR FORCE PLANT NO. 59
JOHNSON CITY, NEW YORK

March 1988

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LIST OF APPENDICES

TITLE

APPENDIX A

DEFINITIONS, NOMENCLATURES, UNITS OF MEASURE

(0472n-5)

DEFINITIONS

Most of the following are derived from the AGI (1976) Glossary.

Term	Definition
Aquifer	Stratum or zone below the surface of the earth capable of producing a significant amount of water as from a well.
Floodplain	That portion of the river valley, adjacent to the river channel, which is built of sediments during the present regimen of the stream and which is covered with water when the river overflows its banks at flood stages.
Flow Velocity	The rate a moving fluid travels. Measured in distance travelled over a given period of time.
Gradient	Slope of a stream or land surface.
Groundwater	That part of the subsurface water which is in the zone of saturation.
Hydraulic Conductivity	Ratio of flow velocity to driving force for viscous flow under saturated conditions of a specified liquid in a porous medium.
Lithology	The physical character of a rock.
Permeability	The capacity of a rock or sediment for transmitting a fluid. Degree of permeability depends upon the size and shape of the pores, the size and shape of their interconnections, and the extent of the latter. It is measured by the rate at which a fluid of standard viscosity can move a given distance through a given interval of time.
Piezometric Surface	Surface to which water in an aquifer would rise by hydrostatic pressure.
Porosity	The ratio of the void volume of a rock or soil to its total volume.
Recharge	a.) Intake. The processes by which water is absorbed and is added to the zone of saturation, either directly or indirectly by way of another formation. b.) The quantity of water that is added to the zone of saturation.

DEFINITIONS (CONTINUED)

Term	Definition
Saturated Thickness	The interval of rock or soil which is saturated with respect to water if all its interstices are filled with water.
Sediment	Solid material settled from suspension in a liquid.
Specific Capacity	A constant indicating the discharge expressed as a rate yield per unit of drawdown.
Specific Yield	The ratio of the volume of water which a rock or soil, after being saturated, will yield by gravity to its own volume.
Stratigraphy	That branch of geology which deals with the formation, composition, sequence and correlation of the stratified rocks as parts of the earth's crust.
Transmissivity	The ease with which water moves through a unit width of aquifer.
Uniformity Coefficient	An expression of variety in sizes of grains that constitutes a granular material.
Water Table	The upper surface of a zone of saturation, except where that surface is formed by an impermeable body.
Zone of Saturation	A subsurface zone in which all the interstices are filled with water under pressure greater than that of the atmosphere.

DEFINITIONS (CONTINUED)

Abbreviation/ Unit of Measure	Definition
A	Surface cross-section through which water flows, where Q = KIA
ADI	Acceptable Daily Intake
AGI	American Geologic Institute
AWQC	Ambient Water Quality Criteria
c	coarse (grain size)
cm	centimeter
cm/sec	centimeters per second
COE	United States Army Corps of Engineers
Cu	Uniformity Coefficient (grain size where D_{60}/D_{10})
D	*Diameter (grain size in millimeters; example:* D_{50}*)*
EPA	United States Environmental Protection Agency
ESE	Environmental Science and Engineering
et al.	and others
F	Fine
ft	feet
ft/day	feet per day
ft^2/day	squared feet per day
GE	General Electric Company
gpd/ft	gallons per day per foot

DEFINITIONS (CONTINUED)

Abbreviation/ Unit of Measure	Definition
gpm	gallons per minute
HART	Fred C. Hart Associates, Inc. (USAF consultant)
HSA	hollow stem auger
I	Gradient (slope of the water), where Q = KIA; V = KI/p
IN	inch
IRP	Installation Restoration Program (of USAF)
K	Permeability, where Q = KIA; V = KI/p
M	Medium (grain size)
MCLs	Maximum Concentration Level
mg/kg	milligrams per kilogram
mg/l	milligrams per liter
min	minutes
mm	millimeters
msl	mean sea level (feet above)
NA	Not Analyzed
NC	Not Computable
ND	No Data; Not Detected
NIDWS	National Interim Drinking Water Standards
NR	Not Reported
NYSAWQSGVs	New York State Ambient Water Quality Standards and Guidance Values

DEFINITIONS (CONTINUED)

Abbreviation/ Unit of Measure	Definition
USAFOEHL	USAF Occupational and Environmental Health Laboratory
p	porosity, where V = KI/p
p.	page
pp	pages
ppb	parts per billion
PPCLs	Preliminary Protective Concentration Limits
ppm	parts per million
PTL	Princeton Testing Laboratory (HART consultant)
PVC	Polyvinyl chloride (well casing)
QA	Quality Assurance
QC	Quality Control
Sec	Seconds
TOC	Top of Casing
UCR	Unit Cancer Risk
ug/gm	micrograms per gram
ug/l	micrograms per liter
USAF	United States Air Force
USAFOEHL	United States Air Force Occupational and Environmental Health Laboratory
USGS	United States Geological Survey
V	Velocity
VOC	Volatile Organic Compound

APPENDIX B

TASK DESCRIPTION - AF STATEMENT OF WORK

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INSTALLATION RESTORATION PROGRAM
PHASE II - CONFIRMATION/QUANTIFICATION (STAGE 1)
Air Force Plant 59, Johnson City, New York
Modification*

I. DESCRIPTION OF WORK

The overall objective of the Installation Restoration Program (IRP) Phase II investigation is to assess potential contamination at past hazardous waste disposal and spill sites on Air Force installations. A series of staged field investigations may be required to meet this objective.

The intention of this staged investigation is to undertake a field and laboratory study at Air Force Plant 59, Johnson City NY: (1) to confirm the presence or absence of contamination within the specified areas of investigation; (2) if possible, to determine the extent and degree of contamination and the potential for migration of those contaminants in the various environmental media; (3) to identify public health and environmental hazards of migrating pollutants based on State or Federal standards for those contaminants; and (4) to delineate additional investigations required beyond this stage to reach the Phase II objectives.

The Phase I IRP Report (mailed under separate cover) incorporates the background and description of the sites/zones for this task. To accomplish this survey effort, the contractor shall take the following actions:

A. General Requirements

1. Conduct a literature search of local hydrogeologic conditions to complement the *Phase I Report* (mailed under separate cover). Use this data to determine optimum well depth and locations. Include the pertinent literature search information in an appendix of the Final Report. Develop the literature search data using the following guideline:

a. Topographic data

b. Geologic data

(1) Structure

(2) Stratigraphy

(3) Lithology

c. Hydrogeologic data

(1) Location of all existing and abandoned wells, including observation wells, and springs, natural ponds and seepages, that occur on or off the installation within a one-mile radius of sites to be investigated.

*Modifications are highlighted by underlined material.

(2) Groundwater table and piezometric contours

(3) Depth to groundwater

(4) Surface and groundwater quality

(5) Recharge, discharge and contributing areas

(6) Geologic setting, yield and hydrographs of springs and natural seepages

d. Data on all existing and abandoned wells, to include observation holes, on or off the installation and within a one-mile radius of sites to be investigated

(1) Location, depth, diameter, types of wells, and logs

(2) Static and pumping water levels, hydrographs, yield, and specific capacity

(3) Present and projected groundwater development and use

(4) Corrosion, incrustation, well interference, and similar operation and maintenance problems

(5) Observation well networks

(6) Existing water sampling sites

e. Aquifer data

(1) Type, such as unconfined, artesian, or perched

(2) Thickness, depths, and formational designation

(3) Boundaries

(4) Transmissivity, storativity, and permeability

(5) Specific retention

(6) Discharge and recharge

(7) Ground and surface water relationships

(8) Aquifer models

f. Climatic data

(1) Precipitation (total and net)

(2) Evapotranspiration

2. Determine the areal extent of the sites by reviewing historical and current panchromatic and infrared aerial photography.

B. Technical Operations Plan

Immediately after the Notice To Proceed (NTP) for the delivery order, develop a Technical Operations Plan (TOP) based on the technical requirements specified in this task description. (See Sequence No. 19 or 20, Item VI below). Follow the TOP format (mailed under separate cover). Provide the TOP to the USAFOEHL within two weeks of the NTP.

C. Health and Safety

Comply with USAF, OSHA, EPA, state and local health and safety regulations regarding the proposed work effort. Use EPA guidelines for designating the appropriate levels of protection needed at the study sites. Prepare a written Health and Safety Plan for the proposed work effort and coordinate it directly with applicable regulatory agencies prior to commencing field operations. Provide an information copy of the Health and Safety Plan to the USAFOEHL after coordination with regulatory agencies. The Health and Safety Plan is specified in Sequence No. 7, Item VI below.

D. Drilling

1. Determine the exact location of all monitor wells <u>and soil borings</u> during the planning/mobilization phase of the field investigation. Consult with plant personnel to minimize disruption of plant activities, to properly position wells with respect to exact site locations, and to avoid underground utilities. Direct the drilling and sampling and maintain a detailed log of the conditions and materials penetrated during the course of the work.

2. Monitor the ambient air during well drilling, work with a photoionization meter or equivalent organic vapor detector to identify the generation of potentially hazardous and/or toxic vapors or gases. Include air monitoring results in the boring logs. In addition, soil samples shall be collected every 5 feet in the unsaturated zone and continuously in the aquifer and stored in glass containers. The head space of the container is to be monitored with a photoionization meter to determine if drill cuttings and fluids should be drummed. If soil encountered during borehole drilling is suspected to be hazardous because of discoloration, odor, air monitoring or sampling monitoring levels, containerize the soil cuttings in new, unused drums. Enter into the boring logs the depth(s) from which suspected contaminated soil cuttings were collected for containerization. Collect a maximum of <u>13</u> composite samples, one from the contents of each drum. Test each composite sample for the parameters specified in Table 1 for drummed materials. Use

RCRA criteria to determine if soil cuttings must be classified as hazardous waste (40 CFR 261.24).

3. Groundwater Monitoring Wells

a. Installation of Ground Water Monitoring Wells

(1) Comply with the U.S. EPA Publication 330/9-S1-002, NEIC Manual for Ground Water/Subsurface Investigations at Hazard Waste Sites for monitoring well installation.

(2) All well drilling, development, purging, sampling methods, and other activity pertaining to this effort must conform to State and other applicable regulatory agency requirements. Cite references in an appendix to the Final Report.

(3) Install wells at a sufficient depth to collect samples representative of aquifer quality and to intercept contaminants if they are present.

(4) Avoid, when possible, installing wells in depressions or areas subject to frequent flooding and standing water. If wells must be installed in such areas, design the wells such that standing water does not leak into the top of the casing or cascade down the annular space.

(5) Drill all monitoring wells using the following specifications:

(a) Drill wells that are less than 100 feet deep using hollow-stem auger techniques. A center stem, plug, and bit attached to the stem may be inserted into the auger for use while drilling. This will prevent material from entering into the hollow stem of the auger.

(b) Take lithologic samples at five-foot intervals and prepare borehole log descriptions. Include pilot boring logs and well completion summaries in the Final Report (Item VI, below).

(c) Drill a maximum of 3 wells. Total footage for all wells in this task shall not exceed 150 linear feet. Refer to the site specific details in Section I.H.

(d) Construct each well with two-inch inside diameter (I.D.) Schedule 80 PVC casing. Use threaded screw-type joints, glued fittings are not permitted. Flush thread all connections. Screen each well using two-inch I.D. casing having up to 0.020 inch slots; slot size may be smaller based upon borehole geology. Screen material must be the same as that of the casing. Cap the bottom of the screen.

(e) Screen all wells so as to collect floating contaminants and to allow for yearly fluctuations of the water table. Screen all shallow wells a minimum of fifteen feet.

(6) Complete all monitoring wells using the following specifications:

(a) Once the casing is installed, allow the soil formation to collapse around the well screen. Supplement the natural gravel-pack with washed and bagged rounded silica sand or gravel with a grain size distribution compatible with the screen and soil formation. Place the pack from the bottom of the borehole to two feet above the top of the screen. Tremie a five foot bentonite seal (granulated or pellets) above the sand/gravel pack. Ensure the bentonite forms a complete seal. Grout the remainder of the annulus to the land surface with a Type I Portland cement/bentonite slurry.

(b) Check with the Plant point of contact (POC) to determine whether wells shall be completed flush or project above the ground surface.

1 If well stick-up is of concern in an area, complete the well flush with the land surface. Cut the casing two to three inches below land surface, and install a protective locking lid consisting of a cast-iron valve box assembly. Center the lid assembly in a three foot diameter concrete pad sloped away from the valve box. Ensure that free drainage is maintained within the valve box. Also, provide a screw-type casing cap to prevent infiltration of surface water. Maintain a minimum of one foot clearance between the casing top and the bottom of the valve box. Clearly mark the well number on the valve box lid.

2 Provide locks for the flush well assemblies. Turn over the lock keys to the Plant POC following completion of the field effort.

(c) Develop each well as soon as practical after completion with a submersible pump, bailer, and/or airlift method. Continue well development until the discharge water is clear and free of sediment. Measure the rate of water produced, the pH, specific conductance and water temperature during well development and include this information in the final report.

(d) Determine by survey the elevation of all newly installed monitoring wells to an accuracy of 0.01 foot. Notch the top of the riser casing where well elevations are established. Horizontally locate the new wells to an accuracy of 1.0 foot and record the position on both project and site specific maps. Bench marks used must have previously been established from and are traceable to a USCGS or USGS survey marker.

(e) Measure water levels at all monitoring wells as feet below the ground surface or below the top of casing elevation to the nearest 0.01 foot. Report as mean sea level (MSL). Measure static water levels in wells prior to well development and before all well purging which precedes sampling events.

b. Recommend a candidate well abandonment method(s) or technique(s) which is applicable to the type of monitoring wells installed and geological conditions. Consider that these wells will be abandoned at some future date after the study objectives have been met and there is no longer a need for the wells. The actual process of well abandonment is not a part of this task order. Assure that the recommended method(s) meets state and/or local well abandonment guidelines or regulations.

c. Complete permits, applications, and other documents which may be required by local and/or State regulatory agencies for the installation of monitor wells. File these documents with appropriate agencies and pay all permitting and filing fees.

4. Well Cleanup

a. Remove all well cuttings, soil borings, soil samples and wastewater and clean the general area following the completion of each well.

b. Containerize and accumulate well cuttings, soil borings and wastewater suspected of being contaminated according to paragraph I.D.2 of this order.

c. Label and transport these drummed wastes to a location designated by the Plant POC.

d. Transport the drummed wastes determined to be hazardous to a disposal site approved by appropriate state and federal regulatory agencies.

e. ASD/PMD is the Generator of these hazardous wastes and will sign the manifest and track and report the disposal of these hazardous wastes.

5. Soil Borings

a. Conduct a maximum of 3 soil borings not to exceed a total of 30 linear feet using hollow stem techniques. Secure two split spoon samples at each borehold and analyze these 6 samples plus 2 other samples furnished by Air Force for the parameters specified in Table 1.

E. Decontamination Procedures

1. Decontaminate all sampling equipment, including internal components, prior to use and between samples to avoid cross contamination. Wash equipment with a laboratory-grade detergent followed by drinking quality water, solvent (methanol), and distilled water rinses. Allow sufficient time for the solvent to evaporate and the equipment to dry completely before reuse.

2. Dedicate for each well the monofilament line or steel wire used to lower sampling equipment into the well; do not use a line in more than one well. Decontaminate the calibrated water level probe for measuring well volume and water level elevation before use in each well.

3. Thoroughly clean and decontaminate the drilling rig and tools before initial use and after each borehole completion. As a minimum, steam clean drill bits after each borehole is installed. Drill from the "least" to the "most" contaminated sites, if possible.

F. Field Sampling

1. Strictly comply with the sampling techniques, maximum holding times, and sample preservation as specified in the following references: Standard Methods for the Examination of Water and Wastewater, 16th Edition (1985), pages 37-44; ASTM, Section 11, Water and Environmental Technology; Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 2nd Edition (USEPA, 1984); Methods for Chemical Analysis of Waters and Wastes, EPA Manual 600/4-79-020, pages xiii to xix (1983); and the Handbook for Sampling and Sample Preservation of Water and Wastewater, EPA Document 600/4-82-029 (1982).

2. Groundwater Monitoring Wells

a. Allow wells to stabilize after development for a minimum of 10 days before sampling.

b. Prior to purging the wells, examine the surface of the water table for the presence of hydrocarbons and take water level measurements to the nearest 0.01 foot with respect to the established survey point on top of the well casing. If applicable, measure the thickness of the hydrocarbon layer.

c. Purge the well using a submersible pump, bailer, or other pertinent method. Purge until a minimum of three well volumes (based on borehole diameter) of water have been displaced and the pH, temperature, specific conductance, color, and odor of the discharge have stabilized using the following criteria: pH ± 0.1 unit, temperature ± 0.5°C, and specific conductance ± 10 µmhos. Include the final measurements in the Results section of the report.

d. Collect water samples with a Teflon bailer. However, to collect representative aquifer samples where floating hydrocarbons are present, use a "thief sampler" or similar device to minimize the influence of the free product.

e. If the well(s) cannot be sampled due to well development, well characteristics, or other reason(s), indicate the reason(s) in the report as specified in Item VI below.

f. Remeasure water levels after sampling and the wells have stabilized.

3. Split all water samples. Analyze one set and immediately ship the other set (the same collection day) to:

USAFOEHL/SA
Bldg 140
Brooks AFB TX 78235-5501

For all split samples sent to the USAFOEHL, complete an AF Form 2752A "Environmental Sampling Data" and/or an AF Form 2752B "Environmental Sampling Data - Trace Organics", (working copies will be provided under separate cover) with the following information:

a. Date and time collected

b. Purpose of sample (analyte and sample group)

c. Installation name (base)

d. Sample number (on containers)

e. Source/location and depth of sample

f. Contract Task Numbers and Title of Project

g. Method of collection (bailer, suction pump, air-lift pump, etc.)

h. Volumes removed before sample taken (well samples only)

i. Special Conditions (use of surrogate standard, etc.)

j. Preservatives used

k. Collector's name or initials

In addition, label each sample container with a permanent ink pen (laundry marker) to reflect the data in a, b, c, d, j and k above.

6. For every 10 field samples collected, take at least one additional sample (a field duplicate) for quality control purposes. Table 1 provides a 10% allowance for these additional analyses. Duplicates shall be indistinguishable from other analytical samples such that personnel performing the analyses are not able to determine which samples are duplicates.

7. For every 20 field water samples collected, prepare and submit for analysis one field blank for all parameters analyzed in water. A minimum of one field blank for each parameter is required. Allowances for these additional analyses are included in Table 1.

8. Maintain chain-of-custody records for all samples, field blanks, and quality control samples.

G. Chemical Analyses

1. Analyze water and soil samples collected as specified in Section H below, Specific Actions. The analytical parameters are summarized in Table 1 along with the required methods.

2. All analyses shall meet the required limits of detection for the applicable EPA method identified in Table 1.

3. For those methods which employ gas chromatography (GC) as the analytical technique (E601, E602, SW8010, SW8020) positive confirmation of identity is required for all analytes having concentrations higher than the Method Detection Limit (MDL). Conduct positive confirmation by second-column GC; however, gas chromatography/mass spectroscopy (GC/MS) can be used for positive confirmation if the quantity of each analyte to be confirmed is above the detection level of the GC/MS instrument. Analytes which cannot be confirmed will be reported as "Not Detected" in the body of the report, but results of all second-column GC or GC/MS confirmational analyses are to be included in the report appendix along with other raw analytical data. Base the quantification of confirmed analytes on the first- column analysis. The maximum number of second-column confirmational analyses shall not exceed fifty percent (50%) of the actual number of field samples (to include duplicates). The total number of samples for each GC method listed in Table 1 includes this allowance. If GC/MS, or a combination of second-column GC and GC/MS, is used, the total cost of all such analyses for a particular parameter shall not exceed the funding allowed for positive confirmation using only second-column GC.

4. All chemical/physical analyses shall conform to state and other applicable Federal and local regulatory agency legal requirements. If a regulatory agency specifies that a type of analysis be performed in a certified laboratory, assure compliance with the requirement and furnish documentation showing laboratory certification with the first analytical data supplied to the USAFOEHL/TS.

5. Archive all raw data, including QA/QC and standards data, for not less than five years after project completion. Supply these data to the USAFOEHL/TS upon request.

H. Specific Site Work

In addition to items delineated in I.A. through I.G. above, conduct the following specific actions at the sites listed below:

1. Locate three sites, one up gradient and two down gradient of the Air Force Plant, for three new monitoring wells. Drill three soil borings to a maximum depth of 50 feet using a hollow stem 6-inch outside diameter auger. Monitor the bored material continuously using an OVA and record all results. Select two soil samples from each boring, one at the soil and groundwater interface, and another sample from the most contaminated portion as determined by the monitoring of the bored material. Analyze each sample for volatile hydrocarbons, volatile halocarbons, primary metals, petroleum hydrocarbons and cyanide. Take two undisturbed samples from each well and determine falling head permeability. Take two additional samples and determine grain size distribution.

2. Using the three bore holes, construct three monitoring wells. Each well to be cased with 2 inch flush joint PVC piping with a 10 foot length screened with a 0.01 inch slot opening.

3. Sample all monitoring and production wells and analyze the samples for specific conductivity, temperature, pH, the primary metals (As, Ba, Cd, Cr, Pb, Hg, Se, and Ag), petroleum hydrocarbons and volatile hydrocarbons, volatile halocarbons and cyanide.

4. Locate on a plot plan of the facility, the surveyed location of all wells, monitoring and production, referenced to a permanent bench mark at the facility. On the same plot plan show by an evaluation drawing the evaluation of a fixed permanent mark on each well casing relative to mean sea level.

5. Measure and report the water level in all wells.

6. Prepare a manual to instruct Air Force designated representative how to measure water levels, how to take water samples, and how to prepare monthly reports of these measurements and the results from the sampling of all wells.

I. Data Review

1. Tabulate field and analytical laboratory results, including field and laboratory parameters and QA/QC data, as they become available and incorporate them into the next monthly R&D Status Report (Sequence No.1, Item VI below) forwarded to the USAFOEHL. In addition to the results, report the following:

a. the time and dates of sample collection, extraction (if applicable) and analysis;

b. the method used and Method Detection Limits achieved;

c. the chain-of-custody forms;

d. a cross-reference of laboratory sample numbers and field sample numbers; and

e. a cross-reference of field sample numbers to wells, boreholes, sites, etc.

2. Upon completion of all analyses, tabulate and incorporate all results into an Informal Technical Information Report (Sequence No. 3, Item VI below) and forward the report to USAFOEHL for review a minimum of two weeks prior to submission of the draft report. Provide as a minimum the information specified in I.I.1 above.

3. Immediately report to the USAFOEHL Program Manager or his supervisor via telephone, data/results generated during this investigation which indicate a potential health risk (for example, a contaminated drinking water aquifer). Follow the telephone notification with a written notice within three days; attach a copy of the laboratory raw data (i.e., chromatogram).

J. Reporting

1. Prepare a draft report delineating all findings of this field investigation and forward it to the USAFOEHL (as specified in Sequence No. 4, Item VI below) for Air Force review and comment. Strictly adhere to the USAFOEHL report format (mailed under separate cover). The format is an integral part of this delivery order. Draft reports are considered "drafts" only in the sense that they have not been reviewed and approved by Air Force officials. In all other respects, "drafts" must be complete, in the proper format, and free of grammatical and typographical errors. Include as a minimum, discussion of the regional/site specific hydrogeology, well and boring logs, data from water level surveys, groundwater surface and gradient maps, water quality and soil analysis results, available geohydrologic cross sections, and laboratory and field QA/QC information. For State's requiring the field work or technical effort be supervised by a State registered geologist, engineering geologist or professional engineer, insert this information in the report to include registration numbers, certificates and seals (as appropriate).

2. Review the Results, Conclusions and Recommendations concerning the sites listed in this task which were investigated during a previous IRP Phase II staged work effort. Use this information and data from previous efforts to establish trends and develop conclusions and recommendations. Integrate all investigative work done at each site to date so the report reflects the total cumulative information for each site studied in this effort.

3. In the Results section, include water and soil analytical results and field quality control sample data. Report all internal laboratory quality control data (lab blanks, lab spikes and lab duplicates) and laboratory quality assurance information in an appendix of the report. Also provide second-column confirmation results and quantities, and include which columns were used, instrument operating conditions, and retention times. Summarize in the appendix the specific collection technique, analytical method (Standard Methods, EPA, etc.), holding time, and limit of detection for each analyte .

4. Make estimates of the magnitude, extent and direction which detected contaminants are moving. Identify potential environmental consequences of the discovered contaminants based upon State or Federal standards.

5. Plot and map all field data collected for each site according to surveyed positions.

6. In the Recommendation section, address each site and list them by category:

a. Category I consists of sites where no further action (including remedial action) is required. Data for these sites are considered sufficient to rule out unacceptable public health or environmental hazards.

b. Category II sites are those requiring an additional Phase II effort to determine the direction, magnitude, rate of movement and extent of detected contaminants. Identify potential environmental consequences of discovered contamination.

c. Category III sites are those that will require remedial action (ready for IRP Phase IV). In the recommendations for Category III sites, include any possible influence on sites in Categories I and/or II due to their connection with the same hydrological system. Clearly state any dependency between sites in different categories. Include a list of candidate remedial action alternatives, including Long Term Monitoring (LTM) as remedial action, and the corresponding rationale that should be considered in selecting the remedial action for a given site. List all alternatives that could potentially bring the site into compliance with environmental standards. For contaminants that do not have standards, EPA recommended safe levels for noncarcinogens (Health Advisory or Suggested-No-Adverse-Response Levels) and target levels for carcinogens (1×10^{-6} cancer risk level) may be used. Unless specifically requested, do not perform any cost analyses, or cost/benefit review for remedial action alternatives. However, in those situations where field survey data indicate immediate corrective action is necessary, present specific, detailed recommendations.

For each category above, summarize the results of field data, environmental or regulatory criteria, or other pertinent information supporting conclusions and recommendations. Reduce this summary information into a table (or tables) and insert it (them) into the text and the Executive Summary.

7. Provide cost estimates by line item for future efforts recommended for Category II sites and LTM Category III sites. Submit these estimates concurrently with the approved final technical report in a separate document. Only the cost requirements outlined in Sequence No. 2, Item VI, need be submitted.

a. For Category II sites, develop detailed site-specific estimates using prioritized costing format (i.e., cost of conducting the required work on: the highest priority site only; the first two highest priority sites only; the first three highest priority sites only; etc., until all required work is discretely costed) for the proposed work effort. The Air Force determines the priority of sites from contractor recommendations. Consider the type of contaminants, their magnitude, the direction and rate of their migration, and their subsequent potential for environmental and health consequences when developing recommendations for site prioritization.

b. For Category III sites slated for long term monitoring, develop site specific estimates which detail the costs associated with: (1) permanent installation of monitoring wells; (2) ground water sampling interface equipment, including permanent installation of pumps and sampling lines; and (3) four quarterly (1 year period) sample collections and laboratory chemical analyses of ground water, etc.

8. Provide an inventory of all on-base wells, to include production, irrigation, monitoring, etc. If the well has been abandoned, note the reason.

9. Reference in an appendix any local, state and/or Federal regulations which require specific well drilling techniques, materials, well development, purging, and sampling methods as specified in this work effort.

K. **Meetings**

The contractor's project leader shall attend 3 meeting(s) to take place at a time to be specified by the USAFOEHL. Each meeting shall take place at Johnson City, New York, for a duration of one eight-hour day.

II. SITE LOCATION AND DATES:

Air Force Plant 59
Date to be established

III. PLANT SUPPORT:

ASD/PMD will provide Base/Plant Support as stated in Appendix 1, hereto.

IV. GOVERNMENT FURNISHED PROPERTY: None

V. GOVERNMENT POINTS OF CONTACT:

1. USAFOEHL Technical Program Manager
   James W. Better
   USAFOEHL/TSS
   Brooks AFB TX 78235-5501
   (512) 536-2158
   AUTOVON 240-2158/2159
   1-800-821-4528

2. MAJCOM Monitor
   Col Marlan J. Humerickhouse
   HQ AFSC/SGPB
   Andrews AFB DC 20334-5000
   (301) 981-5235
   AUTOVON 888-5235

3. Monitor
   Lt Peter Reynolds
   ASD/PMD
   Wright-Patterson AFB OH 45433-6503
   (513) 255-3076
   AUTOVON 785-3076

VI. In addition to sequence numbers 1, 5 and 11 listed in Attachment 1 to the contract, and which apply to all orders, the sequence numbers listed below are applicable to this order. Also shown are dates applicable to this order.

Sequence No.	Para No.	Block 10	Block 11	Block 12	Block 13	Block 14
19 or 20 (TOP)*	I.B.	OTIME	86 AUG 18	86 AUG 25		15
[illegible] (Health & Safety)	I.C.	OTIME	86 AUG 18	86 AUG 25		3
3 (Prelim Data)	I.I.2	OTIME	**	**		3
4 (Tech. Rpt)	I.J.1.	ONE/R	87 MAR 13	87 APR 14	88 MAR 01	***
2 (cost data)	I.J.7.	OTIME	87 APR 14	87 DEC 31		****
14 (Manhour Expend Chart)		MONTHLY	86 SEP 08	86 SEP 15	*****	3
15 (Funds Expend Chart)		MONTHLY	86 SEP 08	86 SEP 15	*****	3

*The Technical Operations Plans (TOP) required for this stage is due within two weeks of the Notice to Proceed.

**Upon completion of the total analytical effort and before submission of the first draft report.

***Two draft reports (25 copies of each) and one final report (50 copies plus the original camera ready copy) are required. Incorporate Air Force comments into the second draft and final reports as specified by the USAFOEHL. Supply the USAFOEHL with an advance copy of the first draft, second draft, and final reports for acceptance prior to distribution. Distribute the remaining 24 copies of each draft report and 49 copies of the final report as specified by the USAFOEHL.

****Submit cost estimates (five copies) in a separately bound document with the Final Report only. Provide estimates for only those sites recommended for additional Phase II work (Category II) and Phase IV, Long Term Monitoring, (Category III).

*****Submit monthly hereafter.

TABLE 1
AIR FORCE PLANT 59
JOHNSON CITY, NEW YORK

Parameters	Method	Water	Soil	QA/QC	2nd Col Conf	Total
		Number of Samples				
1. Specific Conductance	E120.1	4				4
2. pH	E150.1	4				4
3. Temperature	E170.1	4				4
4. Petroleum hydrocarbons						
(Water)	E418.1	4		1		5
(Soil)	SW3550		6	1		7
	E418.1					
5. Primary Metals						
(Water)	E200.7	4		1		5
As	E206.2	4		1		5
Hg	E245.1	4		1		5
Se	E270.2	4		1		5
(Soil/Sediment)	EP Toxicity		14	1		15
6. Halogenated Volatile Organics						
(Water)	E601	4		2	3	9
(Soil)	SW5030		6	1	2	9
	SW8010					
7. Aromatic Volatile Organics						
(Water)	E602	4		2	3	9
(Soil)	SW5030		6	1	2	9
	SW8020					
8. Size Distribution			6			6
9. Permeability			6			6
10. Cyanide	A412D	4	6	1		11
	SW9010					
11. Total Chromium	SW3030		8			8
	SW7191					
12. Drummed materials (a maximum of 12 composite samples to be funded)						
Primary Metals						
Soil	EPA Toxicity		12	1		13
Water	E200.7		12	1		13
As	E206.2		12	1		13
Hg	E245.1		12	1		13
Se	E270.2		12	1		13

APPENDIX 1
PLANT SUPPORT, INSTALLATION RESTORATION PROGRAM (IRP)
AIR FORCE PLANT 59
JOHNSON CITY, NEW YORK

1. The plant will provide the following support for services and materials for the IRP at Air Force Plant 59:

a. Personnel identification badges and vehicle passes and/or entry permits.

b. A staging area for storage of equipment and supplies.

c. A supply of potable water to be used in borehole flushing, equipment cleaning, etc.

d. An area where drilling equipment can be cleaned and decontaminated. Water and electrical hook-ups will be provided if possible.

e. Access to a telephone for use by the contractor. Contractor shall pay for all long distance telephone calls made by his personnel from this phone.

f. Provide engineering site plans, drawings, diagrams, aerial photographs, etc., to be used by the contractor to locate underground utilities affecting the sites to be investigated. The contractor shall return these data items to the plant upon completion of the field work.

2. Hazardous wastes generated by the investigation (drill cuttings, cleaning fluids) shall be properly stored at the site or in specified accumulation areas. Determination of the waste to be hazardous and disposal of any hazardous waste shall be done within ninety (90) days of generation (accumulation into barrels). Disposal of waste will be manifested by the Air Force and disposed of by the IRP contractor.

APPENDIX C

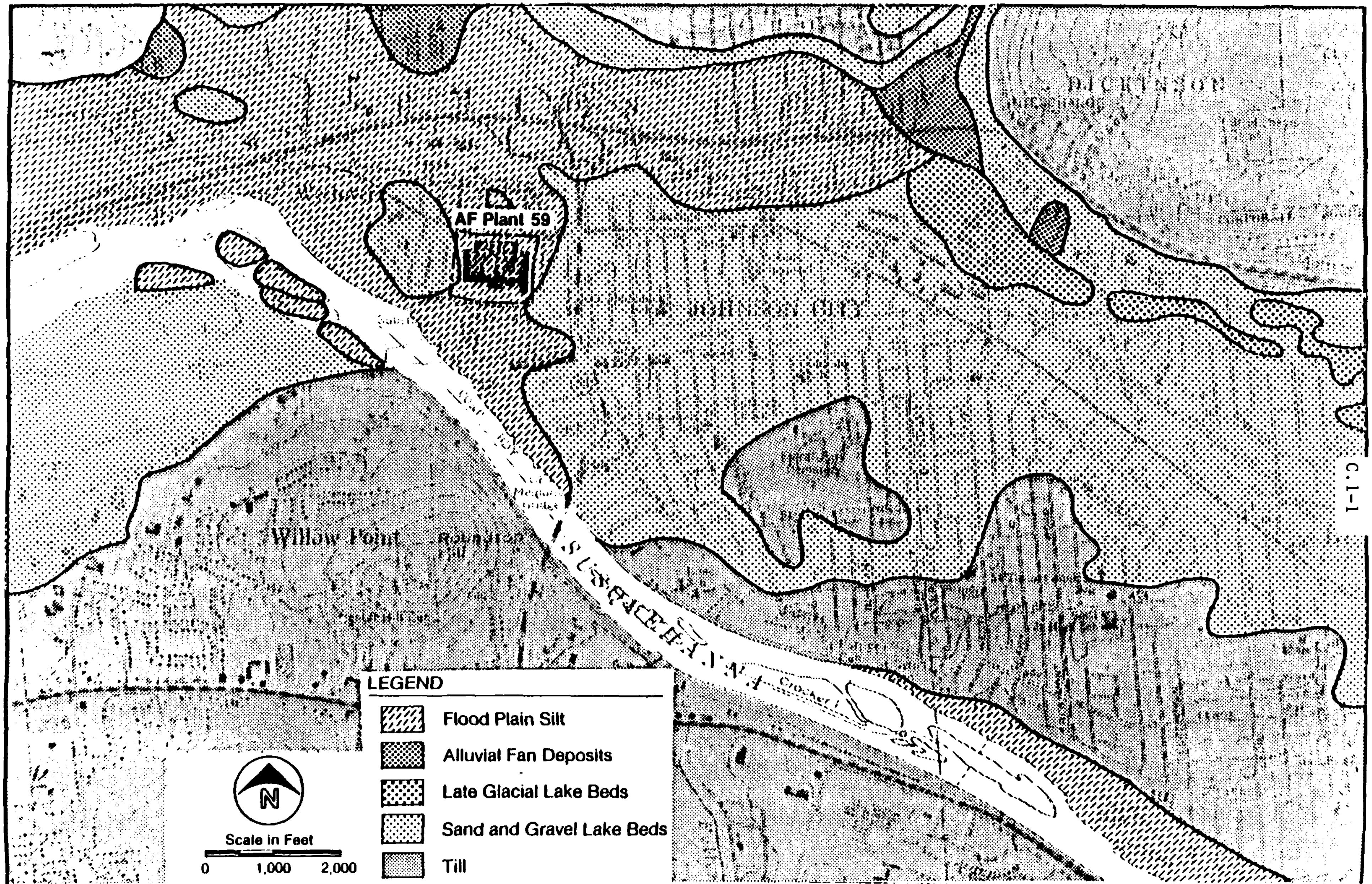
ADDITIONAL DATA - LITERATURE SEARCH

(0472n-7)

APPENDIX C.1

GEOLOGIC DATA

(0472n-37)



Source: New York State
Dept. of Environmental Conservation
Bulletin 73

FIGURE C.1-1

Surficial Geology of Area Surrounding AF Plant 59.

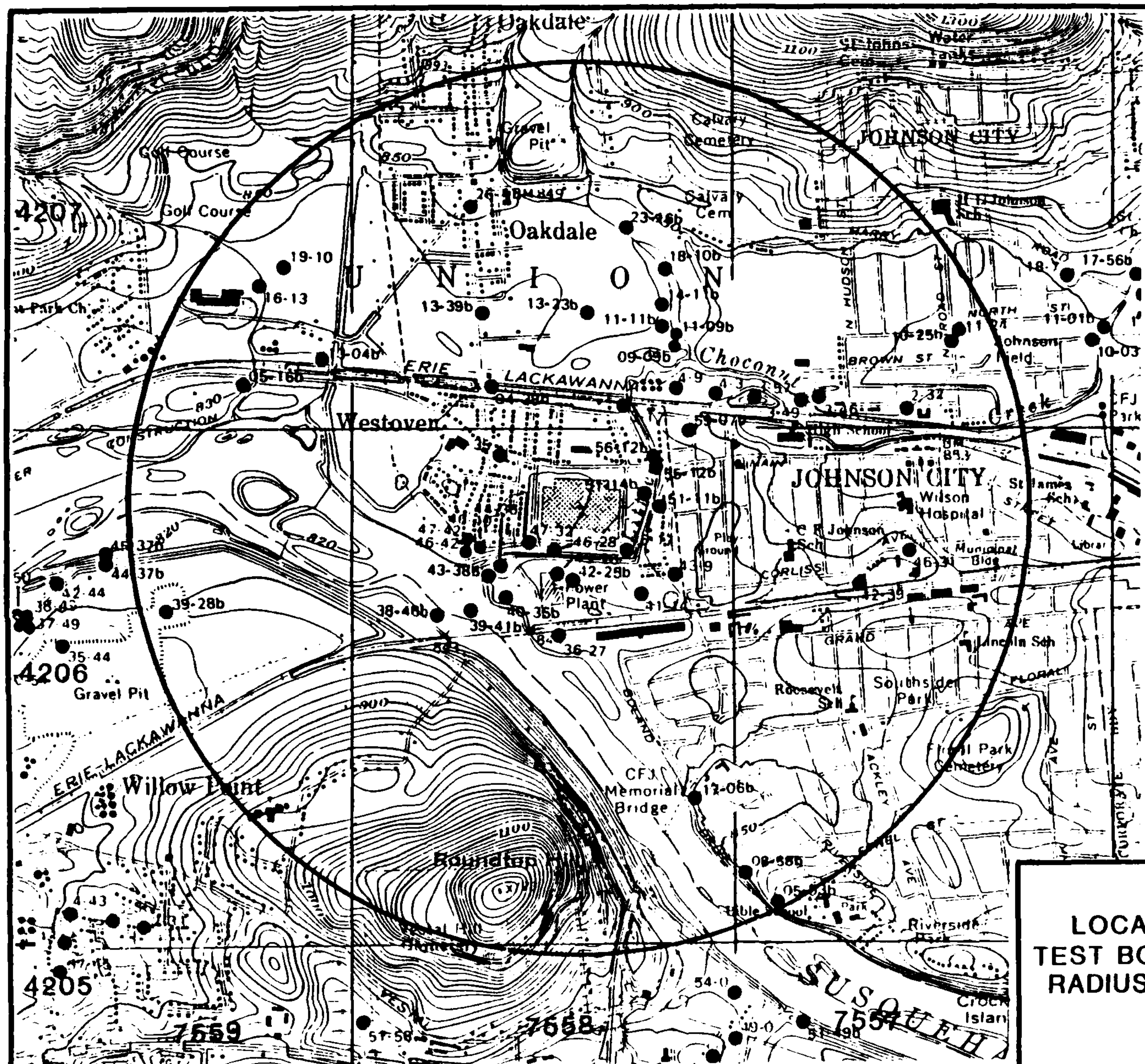
APPENDIX C.2

HYDROGEOLOGIC DATA

(0472n-36)

APPENDIX C.2.1

LOCATIONS AND BORING LOGS FOR WELLS AND BORINGS WITHIN A ONE-MILE RADIUS OF AFP 59



SOURCE: USGS, BULLETIN 69, PLATE 2, 1972

LEGEND

3-43 ● WELL LOCATION AND NUMBER

00-19b ● TEST BORING LOCATION AND NUMBER

1000 0 1000 2000

SCALE (FEET)

1/2 0

SCALE (MILE)

FIGURE C.2-1

LOCATIONS OF WELLS AND TEST BORINGS WITHIN A 1-MILE RADIUS OF JOHNSON CITY, NY

USAF BASE NO. 59
JOHNSON CITY, NY

FRED C. HART ASSOCIATES, INC.

TABLE C.2-1

[1]LIST OF TEST BORINGS AND WELLS WITHIN A ONE-MILE RADIUS OF AFP 59 AS SHOWN ON FIGURE C.2-1

WELL LOCATIONS

11-24
02-32
03-46
03-49
03-57
04-03
04-09
03-17
26-41

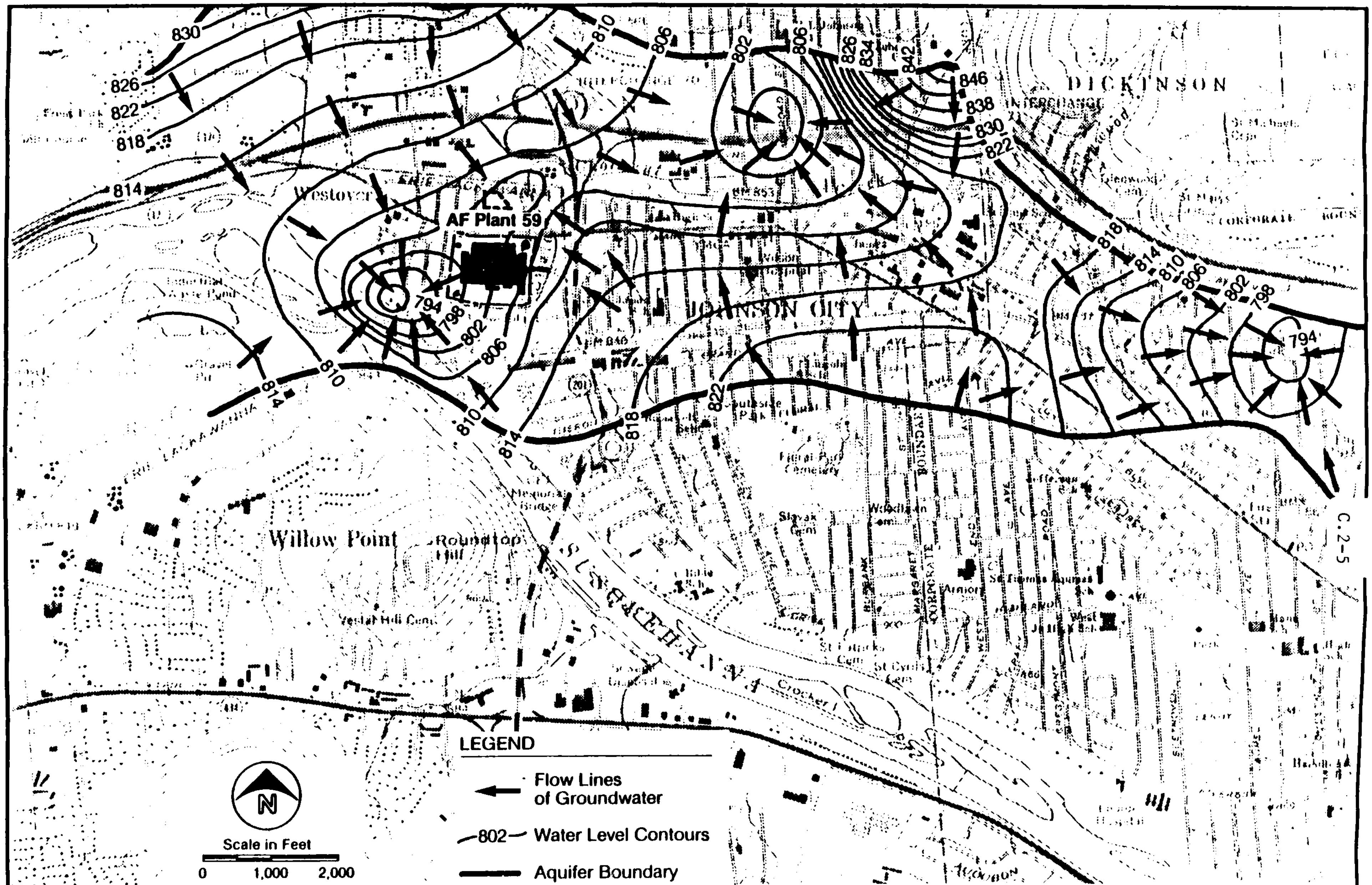
TEST BORING LOCATIONS

05-53b
08-58b
17-06b
59-07b
51-11b
55-12b
56-12b
42-25b
40-35b
43-38b
39-41b
38-46b
39-28b
10-25b
09-09b
11-09b
18-10b
11-11b
14-11b
23-16b
13-23b
13-39b
13-04b
05-16b

1 Refer to Appendix E.3 for well logs corresponding to these well and boring numbers.

APPENDIX C.2.2

HISTORICAL GROUNDWATER CONTOUR MAPS



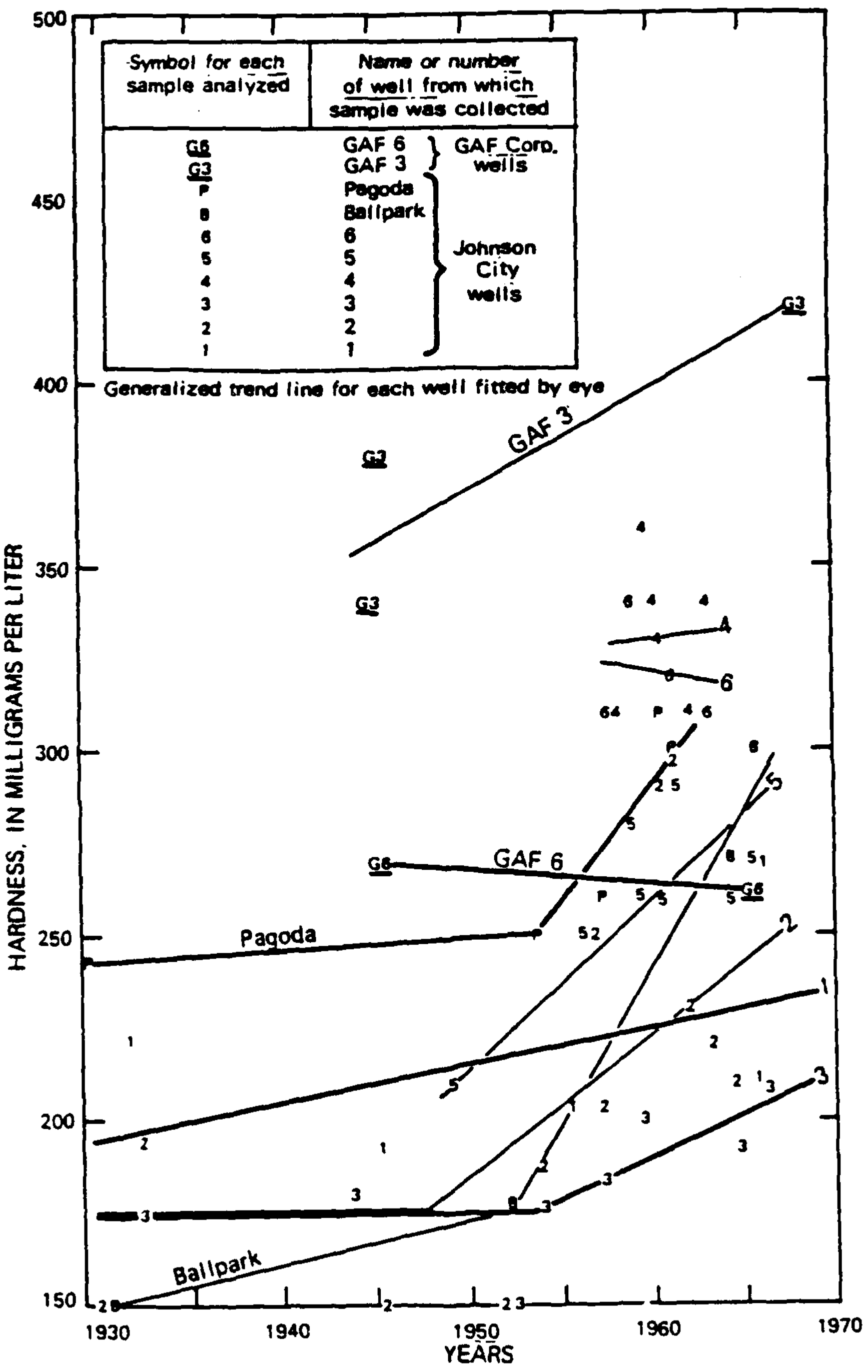
Source: New York State
Dept. of Environmental Conservation
Bulletin 73

FIGURE C.2.2-1
Water Level Contours and Flow Lines in the Clinton Street Ballpark Aquifer, October 1967.

APPENDIX C.2.3

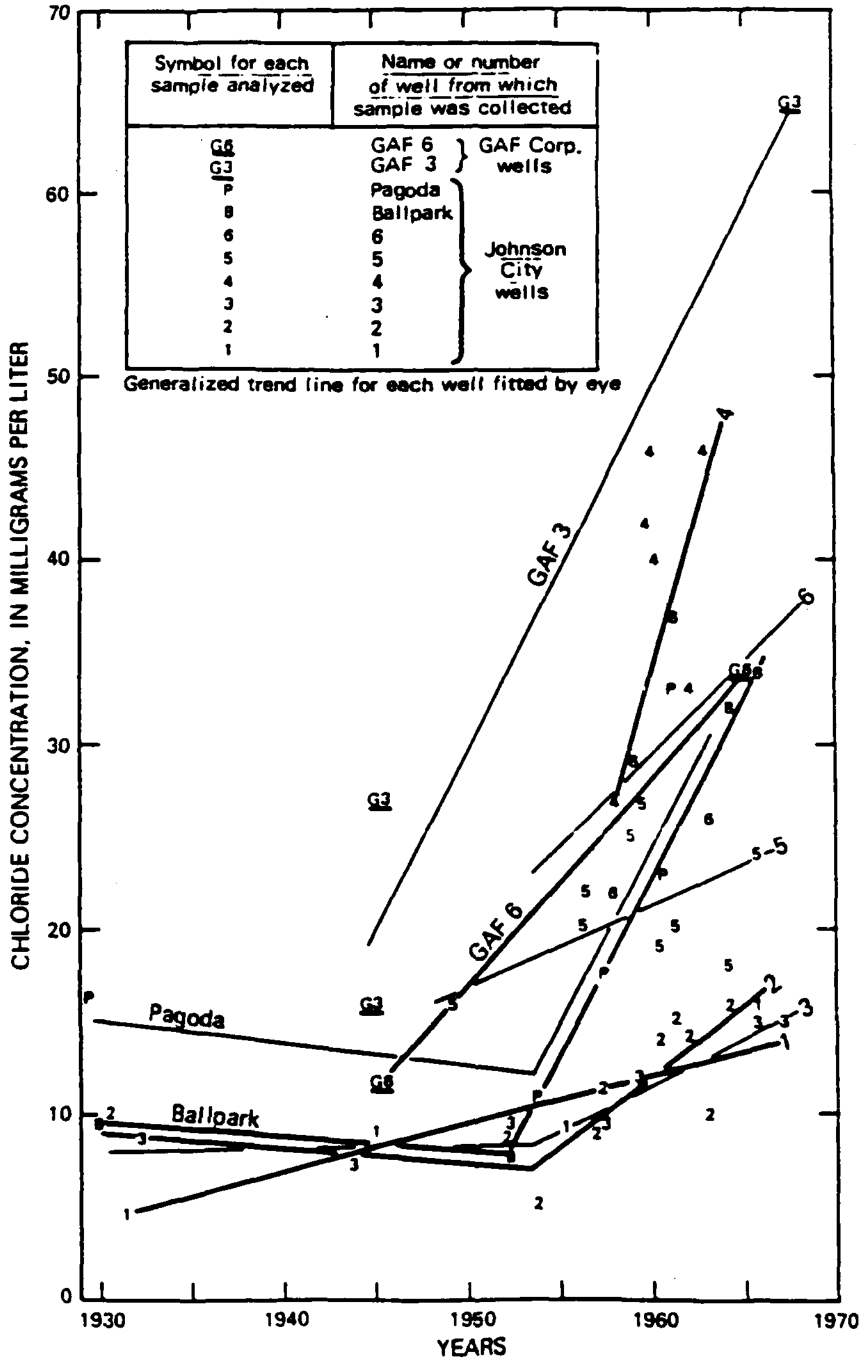
HISTORICAL SURFACE AND GROUNDWATER QUALITY DATA

FIGURE C.2.3-1 Trends in hardness, 1929-69.



Source: New York DEC, Bulletin 73, 1977.

FIGURE C.2.3-2 Trends in chloride concentration, 1929-69.



Source: New York DEC, Bulletin, 73, 1977.

Table C.2.3-1--Estimated average hardness, chloride concentration, and dissolved-solids concentration in water from several sources.

[All values in milligrams per liter.]

Constituent or property of water	Susquehanna River, approaching Binghamton 1/	Chenango River, approaching Binghamton 2/	Susquehanna River at Johnson City: North bank 3/	Susquehanna River at Johnson City: Entire river 4/	Ground water, Clinton Street-Ballpark aquifer 5/
Average hardness (as $CaCO_3$)	55	95	85	75	330
Average chloride concentration	4	4.5	5.5	6.0	35
Average dissolved-solids concentration (residue)	85	125	110	105	400-500

1/ Based on daily samples at Conklin, 1955 (Pauszek, 1959, p. 88), adjusted to represent long-term median flow (1931-60).

2/ Based on daily samples at Greene, 1957 (U.S. Geol. Survey, 1960) and miscellaneous samples elsewhere (Pauszek, 1959, p. 92); adjusted to represent long-term median flow (1931-60).

3/ Based on intermittent samples at Goudey Station in Johnson City, 1953-68 (unpub.), adjusted to represent long-term median flow (1931-60). Because of sewer outfalls upstream from Goudey Station and because the Chenango and Susquehanna Rivers do not mix thoroughly for several miles below their confluence (McDuffie, 1970), samples collected near the north bank at Goudey Station resemble Chenango River water more closely than Susquehanna River water.

4/ Estimated, assuming complete mixing of Chenango and Susquehanna Rivers and sewage.

5/ Based on latest samples analyzed through 1969 from wells not affected by induced recharge; dissolved solids estimated from measured hardness.

Source: New York DEC, Bulletin 73, 1977.

Table C.2.3-2

EFFLUENT MONITORING DATA FROM AF PLANT 59 OUTFALL 001
September 1983 through May 1984

Parameter	3/84 - 5/84 Avg	Max	12/83 - 2/84 Avg	Max	9/83 - 11/83 Avg	Max	6/83 - 8/83 Avg	Max	3/83 - 5/83 Avg	Max	12/82 - 1/83 Avg	Max	9/82 - 11/82 Avg	Max
	(lb/day)		(lb/day)		(lb/day)		(lb/day)		(lb/day)		(kg/day)		(kg/day)	
Oil and Grease	--	13.4	--	6.5	5.91	21.04	8.3	30.6*	13.26	26.72*	2.47	5.15	4.41	24.27*
Limits	--	15.0	--	15.0	16.7	25.0	16.7	25.0	16.7	25.0	7.60	11.40	7.60	11.40
Total Chromium	--	0.14	--	1.01	.520	1.153	0.6	1.45	.29	1.02	.13	.29	.10	.70
Limits	--	2.5	--	2.5	1.25	2.5	1.25	2.5	1.25	2.5	.57	1.14	.57	1.14
Chromium (Hex)	--	.08	--	.07	.151*	.501*	.064	.263*	.17*	.58*	.09*	.25*	.08*	.63*
Limits	--	.26	--	.26	.13	.26	.13	.26	.13	.26	.06	.12	.06	.12
Lead	--	.10	--	--										
Limits	--	.13	--	.13										
Nickel	--	.02	--	.07	.125	.366	.10	.43	.06	.17	.03	.08	.02	.07
Limits	--	.13	--	.13	1.25	2.5	1.25	2.5	1.25	2.5	.57	1.14	.57	1.14
Suspended Solids	--	68.6*	--	50.0	28.4	102.5*	42.96	71.07	32.33	85.10	4.63	12.66	1.97	3.85
Limits	--	55.9	--	55.9	49.9	99.8	49.9	99.8	49.9	99.8	22.70	45.40	22.70	45.40

*Parameter exceeded limits.

Source: CH_2M Hill, 1984.

Table C.2.3-3
OUTFALL 001 EFFLUENT ANALYSIS FOR VOLATILE ORGANIC COMPOUNDS
AF PLANT 59

	Concentrations (µg/L)				
Date	Aug 82	July 83	2/13/84	2/14/84	2/15/84
1,1,1-trichloroethane	1	2	ND[a]	ND[a]	ND[a]
Trichloroethylene (TCE)	24	23	120	47	87
Methylene chloride	--	--	105	8	80
Freons	--	--	ND[b]	ND[b]	ND[b]

--: Not analyzed for

ND[a]: None detected; Detection limit 1.0 µg/L

ND[b]: None detected; Detection limit 5.0 µg/L

Source: CH_2M Hill, 1984.

Table C.2.3-4.--Partial chemical analyses of water from wells

Location: Coordinates of latitude and longitude shown for each well. Wells listed from east to west within successive 1-minute strips of latitude, beginning with the southernmost strip. See text for detailed explanation.

Well depth: All depths below land surface.

Aquifer: QG Unconsolidated deposits (gravel or sand), Pleistocene age.
D Bedrock, Devonian age.

Source of analyses: Most analyses by New York State Department of Health; others by various private laboratories and municipal water departments.

Chemical data: Results in milligrams per liter except pH. Nitrate (NO_3) reported as nitrogen (N); to convert to nitrate, multiply by 4.43. Hardness and alkalinity reported as $CaCO_3$. Total solids determined as residue on evaporation.

From: USGS, Bulletin 69, 1972.

Table C.2.3-4.-- Partial chemical analyses of water from wells (Continued)

LOCATION	OWNER	WELL DEPTH (FT)	AQUI -FER	DATE OF COLLECTION	CHLOR- IDE (CL)	SUL- FATE (SO4)	IRON (FE)	MAN- GAN- ESE (MN)	NITRATE (N)	PH	TOTAL SOLIDS	TOTAL ALKAL- INITY	TOTAL HARD- NESS
4204 49 7649 22	ELMIRA WATER BD	46	QG	7 6 66	40					7.6		160	250
4204 36 7649 27	ELMIRA WATER BD	80	QG	1 13 65	28		.09			7.7		152	214
4204 36 7649 31	ELMIRA WATER BD	58	QG	1 7 65	36		.09			7.6		156	220
4205 24 7549 47	TOWN OF CONKLIN	46	QG	9 28 66	5.0		.14		5.0	6.3		31	54
4205 51 7549 57	STATE HOSPITAL	182	D	7 25 45	4150	< 1.0	9.0	.15		8.3	7535	144	800
4205 59 7550 58	J ROGERS SCHOOL	81	QG	10 29 64	74		4.0		.04	6.8		105	320
4205 37 7554 11	CROWLEY MILK CO	425	D	7 24 45	670	< 1.0	.25	.03		8.5	1292	239	90
4205 59 7554 54	FOWLER DEPT STOR	725	D	7 24 45	1475	< 1.0	.20	.03		7.9	2672	183	176
4205 49 7558 00	HAZARD LEWIS	154	D	7 24 45	310	11	.15	.05		7.4		191	100
4205 54 7558 00	HAZARD LEWIS	114	D	12 20 45	800							145	380
4205 49 7600 53	VESTAL W DIST 4	101	QG	5 23 62	12		.02		1.6			121	176
4205 48 7602 42	ENDICOTT W DEPT	90	QG	10 16 68			.20	.50				140	135
4205 25 7603 22	VESTAL W DIST 1	132	QG	6 8 53	14		.20		1.2	7.2		225	250
				8 30 66	23		< .02		1.6	7.3		194	250
4205 26 7647 13	KENNEDY VALVE	22	QG	4 13 54	45		.08		8.9	6.9		254	380
4205 07 7647 29	ELMIRA WATER BD	95	QG	6 58	1280		2.0			7.9		148	400
4205 07 7647 29	ELMIRA WATER BD	27	QG	9 10 58	20		.00			8.2		152	177
4205 10 7647 31	ELMIRA WATER BD	26	QG	7 2 58	18		.10	.02		6.7	180	111	111
4205 35 7648 24	SWIFT AND CO	59	QG	11 10 43	2.0	44				7.3		46	62
				6 15 44	11	16				8.1		84	100
				2 22 45	6.5	24				7.3		50	82
4206 06 7550 22	HOLIDAY INN	62	QG	5 8 62	28				8.4				
				7 25 68	41				2.1				
4206 12 7553 41	CITY BINGHAMTON	23	QG	11 42	14						360	230	285
4206 58 7554 16	CITY BINGHAMTON	43	QG	6 4 63	54		.02	.00	.96	7.1		224	295
4206 31 7555 13	G A F CORP	109	QG	12 20 45	12							192	270
4206 36 7555 42	G A F CORP	93	QG	7 10 45	16	60	.50	.01		7.3	597	278	340
				12 20 45	27							292	380
4206 58 7556 53	ENDICOTT JOHNSON	52	QG	10 22 29	16				1.6			172	243
				10 30 57	18		< .03		.80	7.4		175	260
				10 6 61	33		.10		.64	7.4		176	300
4206 46 7558 40	JOHNSON CITY	100	QG	12 19 31	4.6				.60			140	221
				7 11 45	9.0	25	.06			7.3	342	175	192
				11 28 55	9.2		.03		1.4	7.7		175	204
				3 1 66	15		.02	.01	.70	7.4		134	210
4206 46 7558 42	JOHNSON CITY	101	QG	7 31 30	9.6				2.0			95	149
				11 4 52	8.4		.11		.60	7.3		143	152
				7 30 57	9.0		< .03		.20	7.2		162	250
				11 23 64	16		.02	< .01	.24	7.6		142	210
4206 47 7558 42	JOHNSON CITY	89	QG	10 11 32	9.0							134	175

Table C.2.3-4.-- Partial chemical analyses of water from wells (Continued)

LOCATION	OWNER	WELL DEPTH (FT)	AQUI -FER	DATE OF COLLECTION	CHLOR- IDE (CL)	SUL- FATE (SO4)	IRON (FE)	MAN- GAN- ESE (MN)	NITRATE (N)	PH	TOTAL SOLIDS	TOTAL ALKAL- INITY	TOTAL HARD- NESS
				3 10 54	11		.15		1.2	7.3		155	176
				12 19 67	15		.02	.01	.70	7.3		148	208
4206 37 7559 50	VESTAL W DIST 4	113	QG	10 17 63	11		.28		.16			135	156
				5 20 69	11		.04			7.9		164	190
4206 28 7559 54	VESTAL W DIST 4	138	QG	5 12 60	6.4		.60			7.4		171	230
				1 28 63	6.6		.02		.66	7.4		210	300
				10 1 63	8.2		.02		1.1	7.3		234	270
				8 23 66	9.0		.02			7.5		213	300
4206 06 7601 01	ENDICOTT W DEPT	94	QG	8 26 42	7.1		.04		.11		204	155	198
4206 00 7601 07	ENDICOTT W DEPT	150	QG	2 22 63			< .50						171
4206 01 7602 09	I B M CORP	159	QG	7 13 45	59	15	.15	.05		7.3	421	170	212
4206 01 7604 55	ENDICOTT W DEPT	128	QG	11 18 60	28		.14		.04	7.7		165	230
4206 01 7604 58	BROOME COUNTY	105	QG	6 10 67	120		4.0		.07	6.5	912	654	654
				6 15 67	140		5.2		.04	6.7	798	637	588
				6 21 67	115		4.6		.04	6.7	835	594	582
4206 42 7616 26	OWEGO WATER WKS	61	QG	2 26 64	24		.04	< .01	.80	7.8		81	128
4206 41 7616 27	OWEGO WATER WKS	22	QG	49						7.6		36	42
4206 42 7648 10	ELMIRA WATER BD	101	QG	9 22 58	32		.10	.00		7.4		233	292
4206 42 7648 12	ELMIRA WATER BD	98	QG	7 60	36		.06			7.4		254	328
4206 37 7649 11	GENERAL ELEC CO	89	QG	6 15 61	10		1.7	.24		7.7		218	250
				7 31 61	13		1.3	.24		7.7		232	252
				4 30 65	23		2.2	.34		7.7		216	268
				7 27 65			2.5	< .01		7.6		216	268
4206 40 7649 11	GENERAL ELEC CO	91	QG	7 20 65			1.5	< .01		7.7		240	260
4206 55 7649 17	HARDINGE BROS	39	QG	5 4 60	52		.24			7.2		262	260
4206 58 7708 38	CORNING GLASS	63	QG	3 21 66	7.0		.30	.09		6.7		26	44
4206 48 7708 39	CORNING GLASS	65	QG	4 12 66	10		.14	.00		7.7		136	180
4206 22 7713 50	ADDISON VILLAGE	40	QG	2 15 65	21		.02		.40	7.1		95	132
4206 19 7714 12	ADDISON VILLAGE	46	QG	7 5 50	14		2.5		2.0	7.0		124	148
4207 11 7557 24	JOHNSON CITY	80	QG	7 31 30	9.6				2.0			95	150
				11 4 52	7.8		.11		1.6	7.4		152	176
				3 1 66	34		.02	.01	.60	7.4		174	300
4207 02 7557 32	JOHNSON CITY	98	QG	12 8 60	40		.10	.08	2.0	7.4		221	330
4207 03 7557 46	JOHNSON CITY	117	QG	10 6 61	37		.06		.30	7.4		191	320
4207 03 7557 49	JOHNSON CITY	101	QG	9 56	23		2.5		.20	7.4		237	330
4207 03 7557 57	JOHNSON CITY	117	QG	8 22 56	29		.20		.02	7.7		231	320
4207 04 7558 03	JOHNSON CITY	115	QG	8 8 56	34		.20		.02	7.3		202	280
4207 04 7558 09	JOHNSON CITY	82	QG	7 26 56	29		.28		.06	7.5		195	270
4207 03 7558 17	JOHNSON CITY	109	QG	9 14 49	16		1.5		.30	7.5		197	210
				9 27 56	23		.02	.00	.10	7.6		170	232

APPENDIX C.2.4

RECHARGE/DISCHARGE DATA

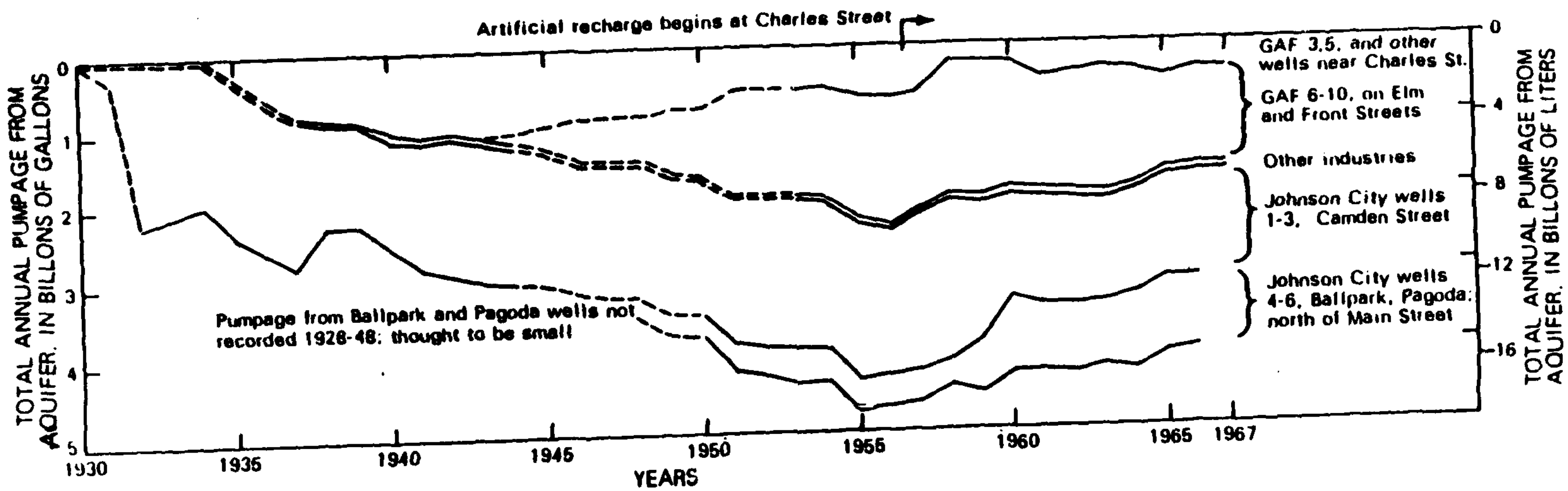


Figure C.2.4-1 --Pumpage from the Clinton Street-Ballpark aquifer, 1930-67. Solid lines indicate pumpage according to records of well owners; dashed lines are estimates. Pumpages shown for GAF wells near Charles Street are actual pumpage less any artificial recharge.

Source: New York DEC, Bulletin 73, 1977.

Table C.2.4-1 --Pumpage and artificial recharge, Clinton Street-Ballpark aquifer, September 1958 to October 1968

[In millions of gallons. Horizontal lines in first column indicate groups of wells whose pumpage was combined when flow lines were drawn and recharge was computed.

Point of withdrawal or recharge 1/	Source of pumpage data 2/	Pumpage or (if preceded by negative sign) recharge									
		1958 3/	1959	1960	1961	1962	1963	1964	1965	1966	1967 4/
Int. Business Machines Country Club wells	E2	1	11	11	29	29	29	29	29	29	27
Johnson City wells 1-3 Total pumpage	M	519	1784	1343	1344	1348	1318	1295	1325	1377	1068
Pumpage derived from aquifer	E3	270	933	501	508	510	498	490	501	520	405
Johnson City well 5	M	--	40	75	136	39	46	153	109	83	113
Johnson City wells											
Well 4	M	--	--	130	140	76	52	--	--	--	--
Well 6	M	--	--	255	446	599	486	55	77	23	43
Ballpark well	H	7	600	334	34	80	151	750	765	789	537
Pagoda well	H	64	--	164	113	92	66	--	--	--	--
GAF Camera Plant well	E	1	3	3	3	3	3	3	3	3	2
Fairbanks Co. well	E1	--	4	4	4	4	4	4	4	4	4
GAF Charles Street wells											
Pumpage, wells 3, 5	O	151	470	480	625	479	435	435	469	418	327
Artificial recharge	O	5/ -72	-250	-240	-193	-68	-110	-55	-28	-60	-54
Titchener Co. well 6/	E1	8	36	36	36	36	38	38	36	36	28
GAF well 10	O	--	183	224	92	197	216	198	36	92	2
GAF well 6	O	5/ 20	90	43	62	120	115	105	85	87	124
GAF well 9	O	5/ 165	643	499	401	383	496	377	376	397	345
GAF well 8	O	5/ 136	443	417	570	390	320	419	248	220	250
Cutler Ice. Co. well	E	6	26	26	26	26	26	26	26	26	20
GAF well 7	O	5/ 125	454	490	415	488	529	450	506	479	262

1/ Wells arranged from west to east
2/ Symbols defined as follows:
- E estimated
- E1 estimated from pump rated capacity and owner's recollection of hours normally operated
- E2 estimated from pump rated capacity and owner's recollection of hours normally operated, multiplied by 0.8 to allow for recharge from irrigation return water and for days not used because of rain
- E3 estimated as 52 percent of total pumpage for 1958-59; 37 percent thereafter; based on flow lines in plates 7 and 8. Remainder of pumpage originates in or beyond Susquehanna River

2/ (continued)
- H estimated from test of pump capacity and from owner's record of hours operated
- M measured by propeller meter
- O measured by pressure drop across constriction in pipeline

3/ September 25 to December 31
4/ January 1 to October 6
5/ Estimated as 25 percent of measured annual total
6/ Half of pumpage combined with GAF wells 3 and 5, half with GAF wells 6 and 10 for computation of recharge

Source: New York DEC, Bulletin 73, 1977.

APPENDIX C.2.5

WATER LEVEL AND PUMPAGE DATA

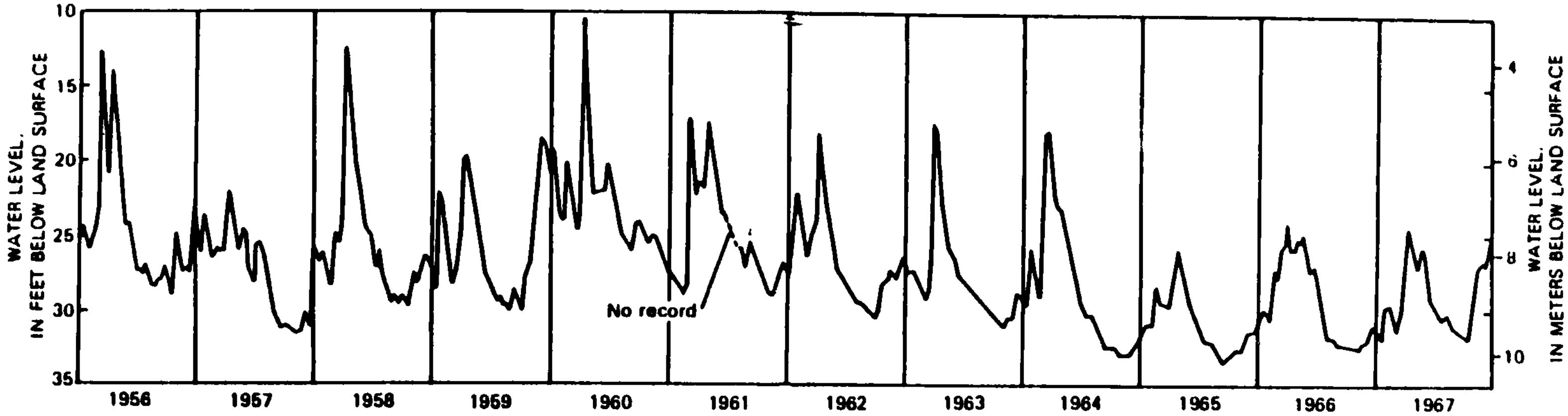


Figure C.2.5-1 --Water levels in U.S. Geological Survey observation well in Johnson City, 1956-1967. This well is near the west end of the Clinton Street-Ballpark aquifer (lat 42°06'57 N.", long 75°58'35 W.") where there is no ridge of till separating the aquifer from the Susquehanna River, and is approximately 1,000 feet (300 meters) north of Johnson City production wells 1, 2, and 3, whose average annual production rate decreased 25 percent after 1959. Therefore, although water levels during the drought of the 1960's were the lowest since records began in 1947, the water-level decline here was not as great as farther east in the aquifer.

Source: New York DEC, Bulletin 73, 1977.

Table C.2.5-1 --Wells in which water-level measurement could be made as of 1971

[Wells listed from east to west within successive 1-minute strips of latitude. Depths, logs, and other specifications of these wells are given in Randall (1972).]

Well identification and location_/: Owner's well number	Latitude	Longitude	Owner_/	Measuring point: Description	Measuring point: Elevation above(+) or below(-) land surface_/ (feet)	Measuring point: Altitude (feet)	Measuring point: Source of altitude measurement_/	Description of well location; remarks
	4206 34	7554 42	Cutler Ice Co.	Top of casing, in pit	-2.6	840	TM	Pumphouse alongside Cutler Ice Co. building. Pumped continuously.
	15	45	U.S. Geol. Survey	Top 2-inch hole in plug atop 6-inch casing	0	845	TM	7 feet north of base of railroad track support
	31	46	do.	Top of 6-inch coupling	+ .9	840.5	USGS	46 feet from toe of dyke, behind 302 Front Street
	27	47	do.	Top threads on 6-inch coupling	+1.8	843.5	do.	Toe of dyke, behind 288 Front Street; 2 wells
				Top of 2.5-inch casing	+1.1	842.8	do.	
	30	48	do.	Top of 6-inch coupling	0	841.9	do.	South property line 294 Front Street, 185 feet from street; 2 wells
				Top of 2.5-inch casing	+ .1	842.0	do.	
	25	50	do.	Top of 6-inch coupling	0	836.3	do.	South property line 258 Front Street, 370 feet from street
	27	51	do.	Top of 6-inch coupling	+ .25	837.5	do.	South property line 266 Front Street, 300 feet from street; 2 wells
				Top of 1.25-inch casing	+ .2	837.5	do.	
G 7	29	51	GAF Corp.	Top of 1-in. plate atop casing, in cellar	-7.5	832.5	do.	Pumphouse, behind 276 Front Street
	32	55	U.S. Geol. Survey	Top 2-inch hole in plug atop bent 6-inch casing, low side	+2	840.5	do.	East curb, at bend in Karlada Drive
G 8	31	57	GAF Corp.	Top of casing, in cellar	-8.4	833.4	do.	Pumphouse, at bend in Karlada Drive
	26	57	U.S. Geol. Survey	Top of 6-inch coupling	0	837.9	do.	Southeast corner of property at 259-265 Front Street
G 9	31	7555 05	GAF Corp.	Top of casing, in cellar	-6.9	836.4	do.	Pumphouse, 290 feet west of Oak Street
G 6	31	13	do.	Top of 24-inch casing, in cellar	-8.8	829.2	do.	Pumphouse. Measuring point is 12.3 feet below elevated floor of pumphouse
G 10	30	18	do.	Top of casing, in cellar	-8.3	831.2	do.	Pumphouse, 70 feet east of Mygatt Street
	16	19	E. H. Titchener, Inc.	--	--	--	--	Production well, no provision for water-level measurement
	17	20	U.S. Geol. Survey	Top of 6-inch coupling	0	855.8	do.	West curb Titchener Street opposite E. H. Titchener side entrance
	39	20	do.	Top 3-inch hole in plug atop 6-inch casing	0	851.9	do.	West curb Mygatt Street, just north of Cypress Street

Source: New York DEC, Bulletin 73, 1977.

Table C.2.5-1 --Wells in which water-level measurement could be made as of 1971 (Continued)

Well identification and location[2/]				Measuring point				
Owner's well number	Latitude	Longitude	Owner[2/]	Description	Elevation above(+) or below(-) land surface[3/] (feet)	Altitude (feet)	Source of altitude measurement[4/]	Description of well location; remarks
G 2 A	4206 36	7555 38	GAF Corp.	Top of 2-inch coupling welded in steel plate	+ .8	845.7	GAF	Room at north end of GAF Building 102, well unused
G 2	37	39	do.	Top of casing	?	--	--	Pumphouse; well unused
G 4	39	39	do.	Top of 10-inch casing, in pit	(-13.7)	836.8	do.	Pumphouse; well unused
G North	36	40	do.	--	--	--	--	Water level measured daily by air line by GAF Corp.
G South	34	40	do.	--	--	--	--	Water level measured daily by air line by GAF Corp.
G 3	36	42	do.	Top of casing, in cellar	(-10.3)	840.4	GAF	Pumphouse.
G 5	38	46	do.	Lip of slot in concrete, in cellar	-8.3	836.3	do.	Pumphouse.
	12	47	U.S. Geol. Survey	Top 2-inch hole in 6-inch plug embedded in concrete	0	867.0	USGS	Sidewalk, west side Jarvis Street opposite north side Balcom Street
G 11	40	58	GAF Corp.	Air line		841±	GAF	84 feet west of Colfax Street, 72 feet south of May Street
G 21 T	43	59	do.	Top of 6-inch coupling	+2.8	842.3	do.	Midway between Colfax and Holland Streets, 240 feet north of May Street
G 23 T	44	7556 05	do.	Top of 2-inch casing	+ .2	841.2	do.	South side Julian Street, 120 feet west of Holland Street
G 25 T	38	08	do.	Floor of recorder shelter	+ .2	860.2	do.	East side Stanley Street, 340 feet north of Clinton Street
	30	11	Fairbanks Co.	Lip north vent hole, elbow removed	+1.0	860.8	USGS	Room on north side of Fairbanks factory
G 24 T	45	13	GAF Corp.	Top of 2-inch coupling	+1.3	841.3	GAF	North side Julian Street, 55 feet west of Johnson Street
G 26 T	36	16	do.	Top of 2-inch coupling	+1.8	862.2	do.	South side Clinton Street, 55 feet west of Janette Street
	51	17	U.S. Geol. Survey	Top 3-inch hole in plug atop 6-inch casing	+ .1	875.2	USGS	Schoolyard, south of gate in west fence
	21	25	do.	Top 2-inch hole in plug atop 6-inch casing	0	869.4	do.	6 feet from fence, northwest corner of schoolyard
	38	30	GAF Corp.	Top hole in sanitary seal	-7.9	851.5	do.	Manhole near fence, east end of property
G 27 T	39	30	do.	Top of 2-inch coupling	+ .8	862.5	GAF	85 feet north of manhole and well 38-30
	34	44	U.S. Geol. Survey	Top 2-inch hole in plug atop 6-inch casing	- .1	875.8	USGS	In small park, equidistant from Park Street and Grand Boulevard
Pagoda	58	53	Endicott-Johnson Corp.	--	--	--	--	Former production well, in pumphouse of oriental design, unused; taped measurement impossible without removing equipment

Source: New York DEC, Bulletin 73, 1977.

Table C.2.5-1--Wells in which water-level measurement could be made as of 1971 (Continued)

Well identification and location 1/				Measuring point				
Owner's well number	Latitude	Longitude	Owner 2/	Description	Elevation above(+) or below(-) land surface 3/ (feet)	Altitude (feet)	Source of altitude measurement 4/	Description of well location; remarks
	4206 46	7557 31	Wilson Hospital	5/	+2.5	849.3	USGS	Pumphouse, in parking lot
	42	39	U.S. Geol. Survey	Top 2-inch hole in plug atop 6-inch casing	+1.5	842.5	do.	End of St. Charles Street, at toe of railroad fill
	43	7558 09	do.	Top of 6-inch casing	0	842.6	do.	South curb Taylor Street, 40 feet from Riverside Drive
	57	35	do.	Floor of recorder shelter	+3.2	836.9	do.	East curb Camden Street, 50 feet south of Main Street; continuous water-level record since 1950
J 1	46	40	Johnson City	Center air line gage	+3.4	842.2	do.	Pumphouse; measurement by air line
J 2	46	42	do.	Center air line gage	+3.8	838.9	do.	Pumphouse; measurement by air line
J 3	47	42	do.	Center air line gage	(+2.9)	840.6	do.	Pumphouse; measurement by air line
	4207 15	7556 55	U.S. Geol. Survey	Top of 6-inch coupling	+ .2	857.1	do.	Parking lot, next to curbing along sidewalk, 140 feet east of creek
	4207 11	7557 24	Johnson City	Top of 2-inch casing in square depression in pumphouse floor	--	--	--	10 feet east of Ballpark well in same pumphouse
Ballpark	11	24	do.	Center air line gage	--	--	--	Pumphouse, Broad St., opposite Carlton St., measurement by air line
J 4	02	32	do.	Lower lip, north access pipe, pump base	+1.2	839.7	USGS	Fenced enclosure
J 6	03	46	do.	Lower lip, west access pipe, pump base	+ .9	838.9	do.	Cinder-block pumphouse, 70 feet from creek
J 4 T	03	49	do.	Top of 6-inch coupling	+3.1	837.1	do.	270 feet west of creek
J 3 T 3	03	57	do.	Top of 6-inch coupling	--	839.4	do.	Area regraded, measuring point several feet above 1971 land surface
J 2 T	04	7558 03	do.	Top of 6-inch coupling	+2.4	834.0	do.	150 feet north of railroad
J 5	03	17	do.	Lower lip, west access pipe, pump base	+ .5	834.8	do.	Pumphouse
	26	41	U.S. Geol. Survey	Top 2-inch hole in plug atop 6-inch casing	0	841.5	do.	Shoulder of paved road, 47 feet from telephone pole
	19	7559 10	Int. Business Machines Corp.	--	--	--	--	Production well; not examined for water-level measurement
	16	13	do.	--	--	--	--	Production well; measurement impossible prior to 1968 renovation

1/ Each well is identified by owner's well number (if any) or by seconds of latitude followed by seconds of longitude. G, GAF Corporation; J, Village of Johnson City; T, test well. In this table, degrees and minutes of latitude and longitude are omitted if the same as preceding well.

2/ Wells owned by the U.S. Geol. Survey were installed for scientific purposes on public rights of way or private land by permission of the landowner. For information contact District Chief, U.S. Geological Survey, Albany, N.Y., 12201.

3/ Values in parentheses are referred to pumphouse floor elevated above grade.

4/ GAF, spirit leveling by GAF Corp., copied from corporation records. TM, estimated from topographic map. USGS, determined by spirit leveling as part of this study; most loops closed and tied to USGS benchmarks, some to city fire hydrants or other reference points.

5/ Water level measured inside pump column. Measuring point lower lip of flange on pump discharge, 0.8 feet above pumphouse floor (altitude 847.6 feet), but because tape must run 0.9 feet horizontally before dropping, altitude of MP is listed as 849.3 feet.

Source: New York DEC, Bulletin 73, 1977.

APPENDIX C.3

CLIMATIC DATA

(0472n-41)

Table C.3-1
METEOROLOGICAL DATA SUMMARY FOR AF PLANT 59, NEW YORK
(1952-1982)

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature (°F)													
Mean	20	23	31	44	55	64	69	67	60	49	38	26	46
Average Daily Maximum	28	30	39	54	65	77	78	76	69	58	45	33	54
Average Daily Minimum	13	15	24	35	46	55	59	58	51	40	32	20	37
Highest Recorded	63	66	82	85	89	94	95	94	96	82	77	65	96
Lowest Recorded	-20	-15	-6	9	25	33	39	37	25	17	3	-18	-20
Precipitation (inches)													
Mean	2.5	2.3	2.8	3.1	3.2	3.7	3.4	3.4	3.3	3.0	3.0	2.9	36.6
Maximum Monthly	6.4	4.4	6.0	5.5	6.5	9.5	7.4	7.5	9.7	9.4	7.5	5.8	9.7
Minimum Monthly	0.C	0.5	0.7	1.6	0.8	1.0	0.8	0.6	0.6	0.3	1.0	0.9	0.3
Maximum in 24 hours	1.8	2.2	2.0	2.9	1.8	3.2	3.2	3.2	3.4	3.9	2.7	1.6	3.9
Days with Thunderstorms	0	0	1	2	4	7	7	5	3	1	0	0	30
Snowfall (inches)													
Mean	19.4	18.1	14.6	4.8	9.3	0.0	0.0	0.0	T	0.4	7.8	19.1	84.5
Maximum Monthly	41.0	44.3	33.5	16.4	3.4	0.0	0.0	0.0	T	2.6	24.4	59.6	59.6
Maximum in 24 hours	18.4	23.0	15.8	11.5	3.4	0.0	0.0	0.0	T	2.4	10.1	15.6	23.0
Relative Humidity (%)													
Mean	76	74	72	66	68	72	72	76	79	74	77	79	73
Surface Winds (knots)													
Mean	12	12	12	12	10	9	8	8	9	10	11	11	10
Maximum	59	66	61	52	54	60	58	58	42	72	57	59	72
Prevailing Direction	WSW	SSE	NW	WNW	NNW	NNW	WSW	SSW	SSW	WSW	NNW	WSW	WSW

T = Trace

Source: National Oceanic and Atmospheric Administration, Local Climatological Data, Binghamton, NY 1982.

From: CH_2M HILL, 1984.

Table C.3-2

SUSQUEHANNA RIVER BASIN C.3-2

01513110 SUSQUEHANNA RIVER AT JOHNSON CITY, NY

LOCATION.--Lat 42°06'37", long 75°58'30", Broome County, Hydrologic Unit 02050103, at intake of the New York State Electric and Gas Corp., Goudey Station, at Johnson City, 100 ft upstream from Little Choconut Creek, 0.5 mi downstream from C.F.J. Memorial Bridge, 3.5 mi downstream from Chenango River and 4.8 mi upstream from discontinued discharge station (01513500) at Vestal.

DRAINAGE AREA.--3,891 mi^2.

PERIOD OF RECORD.--Water years 1956 to current year. Prior to October 1960, published as 01513500, "at Johnson City", and prior to October 1967, published as 01513500, "at Vestal"; however, all water-temperature records were collected at present site.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1955 to current year.

REMARKS.--Daily water-temperature measurements made at 0800 hours. Measurements are reported to whole degrees Celsius. During winter periods water is at times recirculated from inside the plant through the intake to prevent icing conditions, thus resulting in reported water temperatures that are slightly above actual river temperatures.

COOPERATION.--Water-temperature records furnished by the New York State Electric and Gas Corp.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum daily, 29.0°C Aug. 4, 1979, July 21, 1980; minimum daily, freezing point on many days during winter periods, except 1967, 1976, 1978-80 and 1982-3.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum daily, 28.0°C July 5; minimum daily, 1.0°C on many days during February.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1982 to SEPTEMBER 1983

(ONCE DAILY AT 0800)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18.0	12.0	7.0	2.0	2.0	4.0	4.0	12.0	16.0	22.0	26.0	23.0
2	17.0	14.0	10.0	2.0	2.0	6.0	6.0	12.0	15.0	23.0	25.0	23.0
3	17.0	15.0	11.0	3.0	2.0	6.0	7.0	13.0	16.0	26.0	24.0	23.0
4	18.0	16.0	11.0	2.0	1.0	6.0	7.0	14.0	18.0	27.0	25.0	23.0
5	17.0	13.0	12.0	2.0	1.0	7.0	7.0	12.0	17.0	28.0	24.0	23.0
6	18.0	8.0	14.0	2.0	1.0	7.0	7.0	11.0	18.0	24.0	26.0	24.0
7	18.0	8.0	13.0	2.0	1.0	7.0	7.0	12.0	18.0	22.0	25.0	25.0
8	18.0	8.0	10.0	2.0	1.0	7.0	9.0	13.0	18.0	23.0	26.0	23.0
9	18.0	9.0	10.0	2.0	1.0	6.0	8.0	11.0	18.0	24.0	26.0	22.0
10	17.0	7.0	9.0	2.0	1.0	6.0	9.0	10.0	19.0	22.0	24.0	23.0
11	16.0	7.0	4.0	3.0	2.0	4.0	8.0	8.0	19.0	22.0	24.0	24.0
12	14.0	7.0	3.0	3.0	1.0	4.0	8.0	10.0	21.0	23.0	23.0	24.0
13	14.0	9.0	4.0	2.0	1.0	3.0	7.0	11.0	23.0	25.0	20.0	22.0
14	13.0	7.0	4.0	2.0	1.0	4.0	8.0	13.0	23.0	24.0	21.0	19.0
15	13.0	6.0	4.0	2.0	1.0	5.0	9.0	15.0	25.0	25.0	22.0	18.0
16	12.0	4.0	4.0	2.0	1.0	5.0	7.0	14.0	26.0	27.0	23.0	18.0
17	10.0	4.0	4.0	2.0	3.0	6.0	5.0	11.0	24.0	26.0	24.0	17.0
18	9.0	4.0	2.0	2.0	3.0	6.0	7.0	11.0	24.0	27.0	24.0	18.0
19	9.0	5.0	3.0	2.0	2.0	7.0	6.0	12.0	24.0	26.0	25.0	19.0
20	10.0	6.0	3.0	2.0	2.0	8.0	4.0	13.0	25.0	26.0	26.0	21.0
21	12.0	7.0	3.0	2.0	3.0	6.0	3.0	14.0	23.0	26.0	24.0	22.0
22	11.0	9.0	3.0	2.0	3.0	6.0	4.0	15.0	23.0	24.0	23.0	19.0
23	9.0	9.0	3.0	2.0	3.0	3.0	7.0	16.0	24.0	23.0	23.0	16.0
24	8.0	10.0	5.0	2.0	4.0	2.0	8.0	16.0	26.0	23.0	23.0	15.0
25	8.0	7.0	5.0	2.0	3.0	2.0	6.0	15.0	25.0	24.0	23.0	15.0
26	7.0	6.0	6.0	2.0	3.0	2.0	5.0	16.0	23.0	24.0	24.0	16.0
27	8.0	12.0	5.0	2.0	2.0	4.0	7.0	15.0	23.0	24.0	25.0	16.0
28	9.0	9.0	5.0	2.0	3.0	4.0	8.0	14.0	25.0	25.0	26.0	17.0
29	9.0	9.0	5.0	2.0	---	4.0	10.0	16.0	21.0	26.0	26.0	17.0
30	11.0	12.0	6.0	2.0	---	3.0	11.0	14.0	22.0	26.0	26.0	17.0
31	12.0	---	4.0	2.0	---	4.0	---	17.0	---	25.0	25.0	---
MEAN	13.0	8.5	6.0	2.0	2.0	5.0	7.0	13.0	21.5	24.5	24.0	20.0
MAX	18.0	16.0	14.0	3.0	3.0	8.0	11.0	17.0	26.0	28.0	26.0	20.5
MIN	7.0	4.0	2.0	2.0	1.0	2.0	3.0	8.0	15.0	22.0	20.0	15.0

CAL YR 1982	MEAN	11.5	MAX	28.0	MIN	1.0
WTR YR 1983	MEAN	12.5	MAX	28.0	MIN	1.0

From: USGS, Water Data Report NY-83-3, 1983

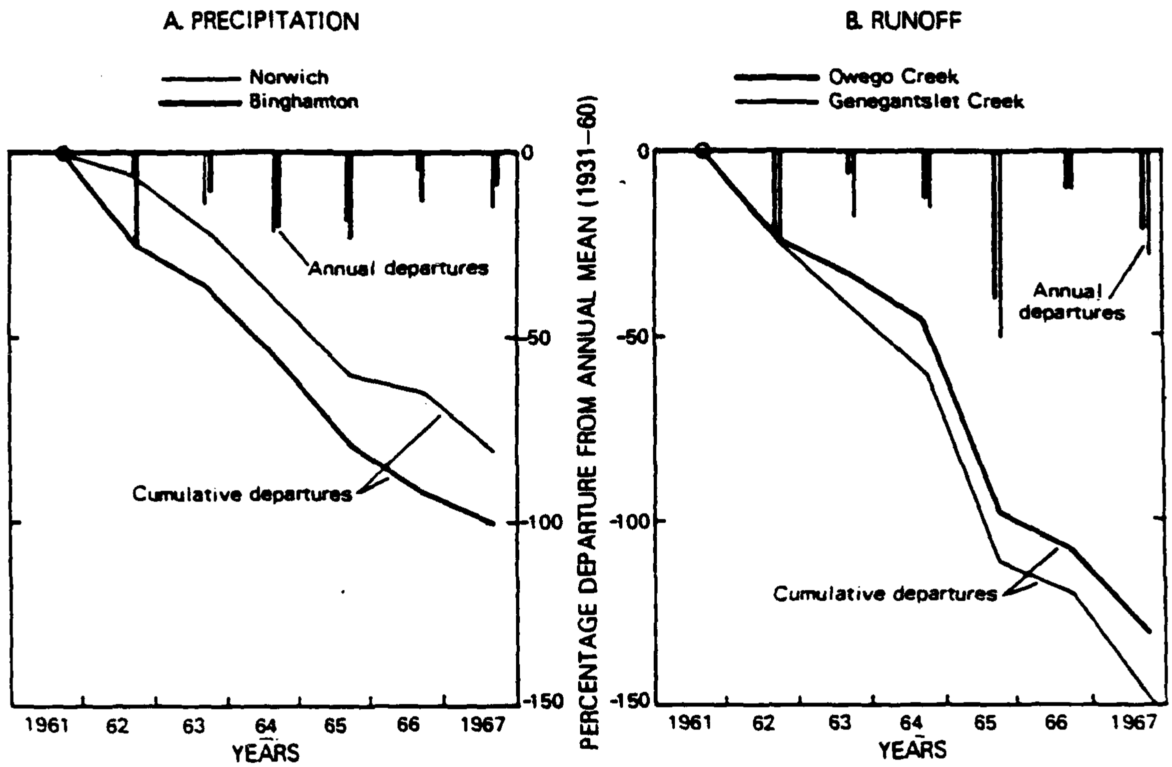


Figure C.3-1.--Departures from normal rainfall and runoff during the 1962-67 drought.

A) Precipitation at Binghamton, near the Clinton Street-Ballpark aquifer, and at Norwich, 35 miles (56 kilometers) northeast of Binghamton.

B) Runoff from Oswego Creek, 18 miles (29 kilometers) west of Binghamton, and from Genegantslet Creek, 22 miles (35 kilometers) north of Binghamton. The cumulative runoff departure from September 30, 1961 through September 30, 1967 was equal to 1.3 and 1.5 years of normal runoff in these two basins, and to 1.5 years runoff in the entire eastern Susquehanna River basin in New York (not shown).

Source: New York DEC, Bulletin 73, 1977.

APPENDIX C.4

WASTE OIL DATA

(CL5121A)

DATE: 02/04/88 Source: Pat Gilligan, General Electric

SUBJECT: OILS USED DURING TIME PERIOD OF BURRIED WASTE OIL TANKS

MOBIL OIL CO.

VACTRA NO. 1	LUBRICATING OIL
VACTRA NO. 2	LUBRICATING OIL
VACTRA NO. 4	LUBRICATING OIL
VELOCITE NO. 3	LUBRICATING OIL
VELOCITE NO. 6	LUBRICATING OIL
VELOCITE NO. 10	LUBRICATING OIL
VELOCITE D	LUBRICATING OIL
MOBIL SOL	HYDRAULIC FLUSH
MOBILMENT 406	HYDRAULIC FLUSH
MOBIL JET	HYDRAULIC OIL
DELVAC	VACUUM PUMP OIL
MOBILMENT OMIGRON	LUBRICATING OIL
DTE LITE	HYDRAULIC OIL
DTE 24	HYDRAULIC OIL

GULF OIL CO.

ENDURANCE 19	TEMPERING OIL
WAY 68	LUBRICATING OIL
SENATE 375	LUBRICATING OIL
SENATE 54	LUBRICATING OIL
SAE 30	LUBRICATING OIL
PARAMOUNT 37	LUBE AND HYDRAULIC OIL
HARMONY 68	LUBE AND HYDRAULIC OIL
HARMONY 48AW	LUBE AND HYDRAULIC OIL
HARMONY 44	LUBE AND HYDRAULIC OIL
HARMONY 97	LUBE AND HYDRAULIC OIL
HARMONY 22	LUBE AND HYDRAULIC OIL
HARMONY 32AW	LUBE AND HYDRAULIC OIL
HARMONY 46AW	LUBE AND HYDRAULIC OIL
11 D	CUTTING OIL
SUPERQUENCH	QUENCH OIL
SENATE 145D	LUBRICATING OIL

SUN OIL CO.

SUNVIST 754	VACUUM PUMP OIL
SUNVIST 951	HYDRAULIC OIL
SUNUP 1050	?????????????
DIALLA A-X	HYDRAULIC OIL
TELLUS 32	HYDRAULIC OIL
TELLIS 23	HYDRAULIC OIL
BREWER 33	HYDRAULIC OIL

OAKITE

OAKITE 202	DETERGENT

VAN STRATTEN	
VANTROL 653	CUTTING
VANTROL 707	CUTTING
5495X	CUTTING
TEXACO	
AIRCRAFT 15	HYDRAULIC OIL
PENNZOIL	
NO. 22	HYDRAULIC OIL
STODDARD SOLVENT	DETERGENT
AW 68	HYDRAULIC OIL
WHITE AND BAGLEY	
NO.2190	CUTTING OIL
EXXON	
DORTAN 34	CUTTING OIL
ISOPAR M	CUTTING OIL
DUBOIS	
MPO 10	HYDRAULIC LUBE OIL
MPO 20	HYDRAULIC LUBE OIL
EGO 80/90	HYDRAULIC LUBE OIL
ELOXOL	
NO. 13	CUTTING OIL
HUBERS	
NO. 202	CUTTING OIL
TRIM	
TRIMSOL	CUTTING
ROBERTS MAINT.	
POWER PLUS	DETERGENT
A33	DISINFECTANT
LEYBOLD HERAEUS	
HE 175	VACUUM PUMP OIL
SARGENT WELCH	
DUO SEAL	VACUUM PUMP OIL

D.A. STUART

THREAD CUT 99	CUTTING OIL

SUNNEN

MB30-5	HONING OIL

GRAHAM

RED TRACTION	LUBRICATING OIL

MONSANTO

SANTOTRAC-50	CUTTING OIL

WCS 02/04/88

APPENDIX D

WELL NUMBERING SYSTEM

D. WELL NUMBERING SYSTEM

A well numbering system was used to identify each well constructed during the on-site remedial investigation. The numbering system provides a tracking procedure to allow retrieval of information about a particular site and assure that each well is uniquely numbered. A listing of well numbers was maintained by the HART field team leader. Each sample number consisted of three parts as described below.

Project Identification

The designation AFP 59 was used to identify the Air Force Plant 59, now known as General Electric electro-mechanical systems production facility.

Site Identification

Each well was identified by a two-letter identifier code, with the following prefix:

SW - Shallow well

A numerical suffix unique to each prefix follows.

Example

AFP 59, SW-1. Air Force Plant No. 59; shallow monitoring well #1.

APPENDIX E

BORINGS AND WELL LOGS

(0472n-9)

APPENDIX E.1

HART - BORING LOGS

(0472n-10)

PROJECT NAME: USAF-JOHNSON CITY
DATE DRILLED: 9/9/86
WELL INSTALLED: SW-1
ON SITE GEOLOGIST : V. DEVILLEZ
DRILLING METHOD: H.S.A.(4.25 IN.)

PROJECT NUMBER: 01071-00
BORING NUMBER: SW1
BOREHOLE GRND ELEV.: 831.90
DRILLING COMPANY: EMPIRE

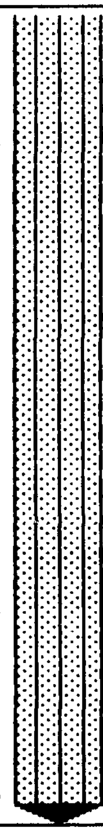
Sample Number	Sample Depth Begin Ft.	Sample Depth End Ft.	Method of Sample Collect	Blows per 6" of Drive	Recov. Ft.				O.V.A. ppm	Feet	Visual Classification
SS-1	0.5	2.0	SS	NR	0.2				NM		[SM] 0 to 0.5 blacktop.
										1	Shale fragments.
										2	
										3	
										4	
SS-2	5.0	7.0	SS	4	0				NM	5	No recovery.
				4							
				4						6	
				5							
										7	
										8	
										9	
SS-3	10.0	12.0	SS	2	0.4				NM	10	Brown, fine, sandy silt;
				4							slightly moist; sand
				4						11	lens 0.5 in. .
				4							
SS-4	12.0	14.0	SS	4	0.5				NM	12	Same as above; wet.
				3							
				5						13	
				4							
SS-5	14.0	16.0	SS	3	0.3				NM	14	Large rounded gravel and
				5							sandy silt; wet.
				7						15	
				10							
SS-6	16.0	18.0	SS	5	0				NM	16	No recovery.
				5							
				7						17	
				10							
SS-7	18.0	20.0	SS	4	1.1				NM	18	Brown silty sand; wet.
				5							
				6						19	
				6							
SS-8	20.0	22.0	SS	3	1.1				NM	20	Brown silty sand with
				6							trace of clay; wet.
				7						21	
				10							
SS-9	22.0	24.0	SS	6	1.2				NM	22	Same as above.
				7							

Log Continued on Next Page

PROJECT NAME: USAF-JOHNSON CITY
DATE DRILLED: 9/9/86
WELL INSTALLED: SW-1
ON SITE GEOLOGIST : V. DEVILLEZ
DRILLING METHOD: H.S.A.(4.25 IN.)

PROJECT NUMBER: 01071-00
BORING NUMBER: SW1
BOREHOLE GRND ELEV.: 831.90
DRILLING COMPANY: EMPIRE

Sample Number	Sample Depth Begin Ft.	Sample Depth End Ft.	Method of Sample Collect	Blows per 6" of Drive	Recov. Ft.				O.V.A. ppm	Feet	Visual Classification
				7						23	
				13							
SS-10	24.0	26.0	SS	8	0.3				NM	24	Coarse, rounded gravel.
				12							
				20						25	
				18							
SS-11	26.0	28.0	SS	16	0.4				NM	26	Medium sand with medium
				14							rounded gravel; wet.
				9						27	
				8							
SS-12	28.0	30.0	SS	4	2.0				NM	28	Medium to coarse sand.
				5							
				7						29	
				7							
SS-13	30.0	32.0	SS	4	0.8				NM	30	Same as above with
				5							minor gravel.
				7						31	
				9							
SS-14	32.0	34.0	SS	NR	1.0				NM	32	Same as above.
										33	
SS-15	34.0	36.0	SS	NR	1.1				NM	34	same as above.
										35	
										36	



PROJECT NAME: USAF-JOHNSON CITY
DATE DRILLED: 9/11/86
WELL INSTALLED: SW-2
ON SITE GEOLOGIST : V. DEVILLEZ
DRILLING METHOD: C.M.E.

PROJECT NUMBER: 01071-00
BORING NUMBER: SW2
BOREHOLE GRND ELEV.: 828.90
DRILLING COMPANY: EMPIRE

Sample Number	Sample Depth Begin Ft.	Sample Depth End Ft.	Method of Sample Collect	Blows per 6" of Drive	Recov. Ft.			O.V.A. ppm	Feet	Visual Classification
SS-1	0.5	2.0	SS	4	0.6			NM		[SM] Brown sandy silt, slightly
				8					1	moist.
				11						
									2	
									3	
									4	
SS-2	5.0	7.0	SS	8	0.7			NM	5	Brown silt and medium
				14						sand; moist.
				9					6	
				5						
									7	
									8	
									9	Easy drilling at 9 Ft..
SS-3	10.0	12.0	SS	3	0.7			NM	10	Medium to fine, brown
				4						sand with trace of silt.
				7					11	
				7						
SS-4	12	14	SS	6	1.3			NM	12	Same as above with
				6						more silt.
				7					13	
				6						
SS-5	14.0	16.0	SS	9	0.6			NM	14	Same as above.
				8						
				7					15	
				4						
SS-6	16.0	18.0	SS	3	0.6			NM	16	Medium rounded gravel
				5						with silty sand.
				12					17	
				12						
SS-7	18	20	SS	25	0.3			NM	18	Fine to medium silty
				22						sand; wet.
				21					19	
				25						
SS-8	20.0	22.0	SS	29	0.5			NM	20	Angular gravel/rock
				22						fragments; wet.
				17					21	
				15						
SS-9	22.0	24.0	SS	12	1.0			NM	22	Same as above; saturated.
				12						

Log Continued on Next Page

PROJECT NAME: USAF-JOHNSON CITY
DATE DRILLED: 9/11/86
WELL INSTALLED: SW-2
ON SITE GEOLOGIST : V. DEVILLEZ
DRILLING METHOD: C.M.E.

PROJECT NUMBER: 01071-00
BORING NUMBER: SW2
BOREHOLE GRND ELEV.: 828.90
DRILLING COMPANY: EMPIRE

Sample Number	Sample Depth Begin Ft.	Sample Depth End Ft.	Method of Sample Collect	Blows per 6" of Drive	Recov. Ft.				O.V.A. ppm	Feet	Visual Classification
				15						23	
				10							
SS-10	24.0	26.0	SS	18	1.0				NM	24	Same as above.
				21							
				15						25	
				14							
										26	

PROJECT NAME: USAF-JOHNSON CITY
DATE DRILLED: 9/10/86
WELL INSTALLED: SW-3
ON SITE GEOLOGIST : R. GOLDMAN
DRILLING METHOD: H.S.A.(4.25 IN.)

PROJECT NUMBER: 01071-00
BORING NUMBER: SW3
BOREHOLE GRND ELEV.: 829.40
DRILLING COMPANY: EMPIRE

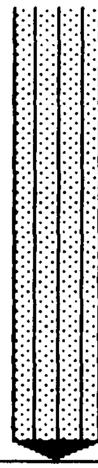
Sample Number	Sample Depth Begin Ft.	Sample Depth End Ft.	Method of Sample Collect	Blows per 6" of Drive	Recov. Ft.				O.V.A. ppm	Feet	Visual Classification
SS-1	0	2.0	SS	4, 5	0.3				0		[SM] 0 to 4" topsoil: dark
				5						1	brown with trace of gravel.
				5							
										2	
										3	
										4	
SS-2	5.0	7.0	SS	12	0.6				0	5	Silty, medium brown sand
				18							and pebbles.
				25						6	
				17							
										7	
										8	
										9	
SS-3	10.0	12.0	SS	10	1.0				4	10	Silty, fine to coarse sand
				22							and pebbles.
				34						11	
				38							
SS-4	12.0	14.0	SS	25	0.3				0	12	Same as above.
				12							
				11						13	
				11							
SS-5	14.0	16.0	SS	8	1.0				2.8	14	Same as above.
				10							
				13						15	
				15							
SS-6	16.0	18.0	SS	20	1.0				0.4	16	Same as above.
				18							
				23						17	
				25							
SS-7	18.0	20.0	SS	16	1.0				2.4	18	Same as above; moist.
				14							
				14						19	
				20							
SS-8	20.0	22.0	SS	24	1.0				0.4	20	Same as above; moist.
				25							
				24						21	
				26							
SS-9	22.0	24.0	SS	8	0.9				9.0	22	Medium to coarse sand; wet.
				14							

Log Continued on Next Page

PROJECT NAME: USAF-JOHNSON CITY
DATE DRILLED: 9/10/86
WELL INSTALLED: SW-3
ON SITE GEOLOGIST : R. GOLDMAN
DRILLING METHOD: H.S.A.(4.25 IN.)

PROJECT NUMBER: 01071-00
BORING NUMBER: SW3
BOREHOLE GRND ELEV.: 829.40
DRILLING COMPANY: EMPIRE

Sample Number	Sample Depth Begin Ft.	Sample Depth End Ft.	Method of Sample Collect	Blows per 6" of Drive	Recov. Ft.				O.V.A. ppm	Feet	Visual Classification
				13						23	
				11							
SS-10	24.0	26.0	SS	10	0.9				1.2	24	Medium to coarse sand and
				10							gravel.
				18						25	
				16							
SS-11	26.0	28.0	SS	25	0.7				1.2	26	Medium to coarse sand with
				24							trace of gravel.
				20						27	
				17							
SS-12	28.0	30.0	SS	20	0.7				1.6	28	Same as above.
				19							
				12						29	
				17							
										30	



PROJECT NAME: USAF-JOHNSON CITY
DATE DRILLED: 9/12/87
ON SITE GEOLOGIST: V. DEVILLEZ
DRILLING METHOD: H.S.A.(2.25 IN.)

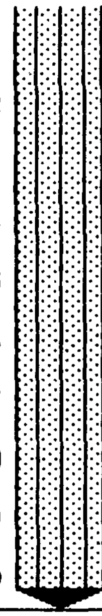
PROJECT NUMBER: 01071-00
BORING NUMBER: SB1
DRILLING COMPANY: EMPIRE

Sample Number	Sample Depth Begin Ft.	Sample Depth End Ft.	Method of Sample Collect	RECOV. FT.						Feet	Visual Classification
											[SM] Blacktop to 0.5 ft.
SS-1	0.5	2.0	SS	0.3						1	Brown silty fill.
SS-2	2.0	4.0	SS	0.6						2	Brown, sandy, silty fill.
										3	
SS-3	4.0	6.0	SS	0.5						4	Brown sandy, silty fill with gravel/pebbles.
										5	
SS-4	6.0	8.0	SS	0						6	No recovery.
										7	
SS-5	8.0	10.0	SS	0.1						8	Very little recovery.
										9	
										10	

PROJECT NAME: USAF-JOHNSON CITY
DATE DRILLED: 9/12/86
ON SITE GEOLOGIST: V. DEVILLEZ
DRILLING METHOD: H.S.A.(2.25 IN.)

PROJECT NUMBER: 01071-00
BORING NUMBER: SB2
DRILLING COMPANY: EMPIRE

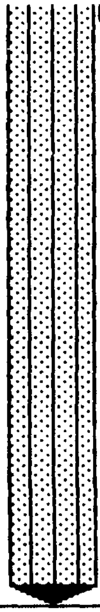
Sample Number	Sample Depth Begin Ft.	Sample Depth End Ft.	Method of Sample Collect	RECOV. FT.						Feet	Visual Classification
SS-1	0.5	2.0	SS	0.8							[SM] Blacktop to 0.5 ft.;
										1	brown silty fill.
SS-2	2.0	4.0	SS	0.1						2	Very little recovery.
										3	
SS-3	4.0	6.0	SS	0.5						4	Brown silty fill with
											rock fragments.
										5	
SS-4	6.0	8.0	SS	0.7						6	Same as above.
										7	
SS-5	8.0	10.0	SS	0.2						8	No recovery other than rock
											fragments.
										9	
										10	



PROJECT NAME: USAF-JOHNSON CITY
DATE DRILLED: 9/12/86
ON SITE GEOLOGIST: V. DEVILLEZ
DRILLING METHOD: H.S.A.(2.25 IN.)

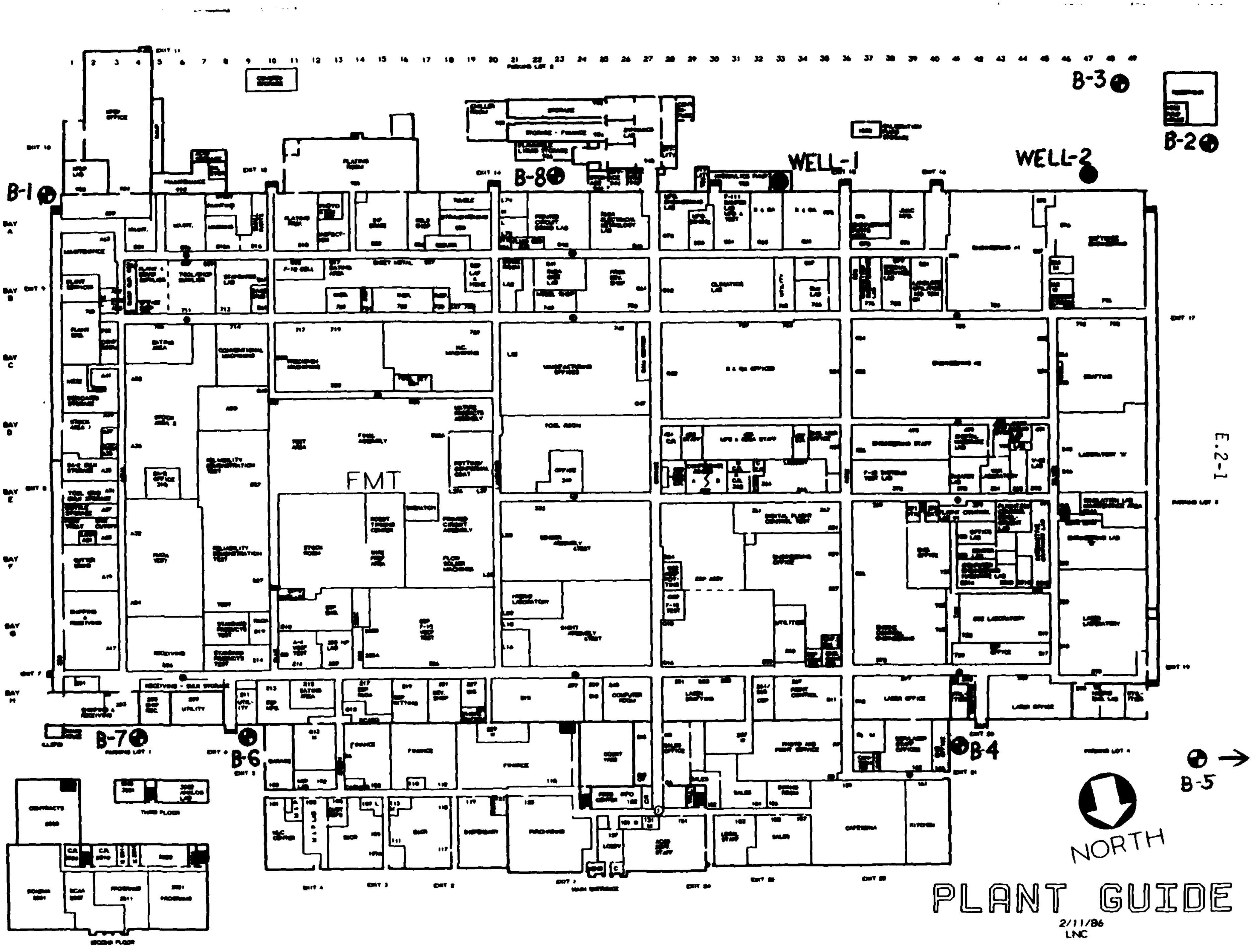
PROJECT NUMBER: 01071-00
BORING NUMBER: SB3
DRILLING COMPANY: EMPIRE

Sample Number	Sample Depth Begin Ft.	Sample Depth End Ft.	Method of Sample Collect	RECOV. FT.						Feet	Visual Classification
SS-1	0.5	2.0	SS	0						1	[SM] Blacktop to 0.5 ft.; No recovery.
SS-2	2.0	4.0	SS	0.6						2	Brown silty fill with rock fragments; moist in bottom.
										3	
SS-3	4.0	6.0	SS	0.3						4	Brown silty fill; slightly moist.
										5	
SS-4	6.0	8.0	SS	0.5						6	Brown medium silty sand.
										7	
SS-5	8.0	10.0	SS	0.4						8	Same as above with rock fragments.
										9	
										10	



APPENDIX E.2

OTHER AFP 59 BORING LOGS


E.2-1
B-1
B-2
B-3
B-4
B-5
B-6
B-7
B-8
WELL-1
WELL-2
FMT
NORTH
PLANT GUIDE
2/11/86
LNC

WATER RECHARGE WELL (# 2)

General Electric Corporation Plant
Johnson City, N. Y.

Driller: Douglas Tubbs
Tool Dresser: Dan Thurston, Greg Schmitt

Depth: 94'0"
Bed Rock: 94'0"
Casing: 81'9" of new 14" OD (cut off 12" above grade)
Well Screen:
   Overall length------21'6"
   Screen length-------20'0"
   Lead packer top-----5"
   Stainless steel tight wind upper extension--18"
   Bottom-closed bail type
   Upper 5 ft. of screen # 40 slot
   Bottom 15 ft. of screen # 80 slot
   Material-# 304 Stainless steel
   Manufacturer- UOP Johnson Division
Static Water Level-15 ft. below grade
[Casing driven over screen 7'9" to shut off sand]

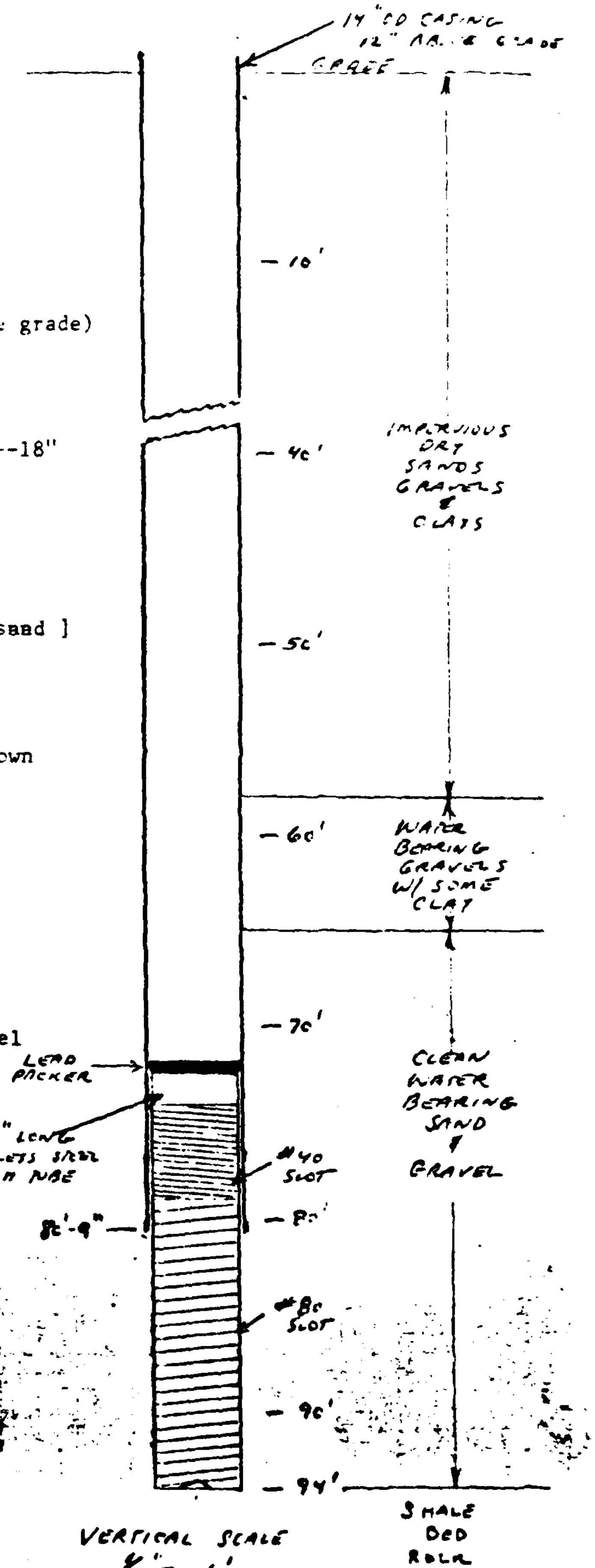
Pump Tested: August 20, 1974
   120 GPM at 80 ft.

Specific Capacity: 1.84 GPM per foot of drawdown

Hole Completed: August 21, 1974

Well log:

0 - 1'	blacktop and soil
1'-21'	sand & gravel (dry)
21'-28'	sand & gravel w/large stones (dry)
28'-60'	clay & gravels (dry)
60'-65'	gravel w/some clay (some water)
65'-94'	clean water bearing sand, fine gravel
94'	shale bed rock



SILVER CREEK, N. Y.

Date August 20, 1974

PAGE # 1

OWNER: General Electric Corporation LOCATION: Same
Johnson City, New York

WELL # 2 FOREMAN: Terry Allenson DURATION OF TEST: 2 Hours

Diameter: 13.25" Depth: 94 ft. TYPE OF WELL: Gravel(X)Rock( )Old Hole (X)

Drive Pipe: Yes(X)No( ) Diameter: 14" OD Length: 81 ft. 9 in.

Screen: Yes(X)No( ) Diameter: 113/8" I.D. 12 1/2" O.D. length: 20' Type: # 304 Stainless steel telescope type

Slot Size: Top 5 ft. # 40, bottom 15 ft. # 80 Overall Length: 22'0

Top of Bowls @ 85 ft. Length Air Line: XX ft. Discharge Pipe: 8 in.

Orifice Size: 4 in. TYPE PUMP: Turbine (X) Submersible ( ) Suction ( )

TYPE DEPTH READING DEVICE: Altitude Gauge ( ) Electrical Water Level (X)

STATIC WATER LEVEL: 15 ft. WATER SAMPLE TAKEN BY: Nene taken

	TIME	BACK PRESS IN INCHES	ORIFICE	GPM	ALTITUDE	WATER LEVEL	WATER LEVEL IN OBS. HOLE
8-21-74	7:30 AM		4"	60		20'	16' from top of casing
	7:45		4"	70		45'	
	8:15		4"	80		60'	
	8:45		4"	80		65'	
	9:15		4"	120		80	
	9:45		4"	120		80	

E.2-4

ALLENDALE ROAD
BINGHAMTON N. Y. 13903
722 - 0030

COSTELLO'S LABORATORY INC.

SUCCESSOR TO NELSON & LAUDER
CHARLES V. COSTELLO
CONSULTING SANITARY CHEMIST

LABORATORY FOR
SANITARY & ANALYTICAL
CHEMISTRY

RESULTS OF EXAMINATION OF WATER

LABORATORY NO. C 67,74 COLLECTED BY Parke Well Drillers

DATE COLLECTED 5/15/74 RECEIVED 5/15/74 REPORTED 5/18/74

PLACE Johnson City N. Y. (CITY, TOWN, VILLAGE OR HAMLET) COUNTY Broome

SAMPLING POINT General Electric Well # 1

OWNER TENANT

BACTERIAL EXAMINATION

TEST FOR COLIFORM GROUP

BACTERIA PER ML. AGAR 35°C - 24 HRS

M. P. N. * / 100 ML

THIS WATER WAS ______ OF A SATISFACTORY SANITARY QUALITY WHEN THE SAMPLE WAS COLLECTED

PHYSICAL EXAMINATION

COLOR 2 TURBIDITY 1 ODOR + COLD Veg + HOT

CHEMICAL EXAMINATION

RESULTS IN PARTS PER MILLION

IRON (Fe)	.10	AMMONIA FREE (AS N)		OXYGEN CONSUMED (O)	
MANGANESE (Mn)	less than .01 as Rec'd	NITROGEN CONSTITUENTS: ALB. AMMONIA (AS N)		CHLORIDES (Cl)	33
CARBON DIOXIDE (CO_2)	7	NITRITES (AS N)		TOTAL HARDNESS (AS $CaCO_3$)	380
FLOURIDES (F)		NITRATES (AS N)	.10	ALKALINITY (AS $CaCO_3$)	265
TOTAL SOLIDS	499	LOSS OF IGNITION		CALCIUM (AS $CaCO_3$)	282
BICARBONATES	318	SULFATES	140	MAGNESIUM (AS $CaCO_3$)	99
SILICA		COPPER		ELECTROMETRIC PH VALUE	7.3
TOTAL PHOSPHATES		ORTHO PHOSPHATES		META PHOSPHATES	
SUSPENDED MATTER		TEMPT AIR °F		TEMPT WATER °F	
DETERGENTS					

REMARKS:

Charles V. Costello

CHARLES V. COSTELLO

* MOST PROBABLE NUMBER

+1=VERY SLIGHT, 2=SLIGHT, 3=DISTINCT, 4=DECIDED, 5=EXTREME

WATER SUPPLY WELL # 1

General Electric Corporation Plant
Johnson City, New York

Driller: Douglas Tubbs
Tool Dresser: Dale Buel

Depth: 94'7"
Bed Rock: 94'7"
Casing: 75 ft. of new 14" OD (cut off 6" above grade)
Well Screen:
- Overall length------22'1"
- Screen length-------20'0"
- Lead packertop------5"
- Stainless steel flush tube upper extension--19"
- Bottom-closed bail type
- Upper 5 ft. of screen # 40 slot
- Bottom 15 ft. of screen # 80 slot
- Material-# 304 stainless steel
- Manufacturer-UOP Johnson Division

Static Water level-15 ft. below grade

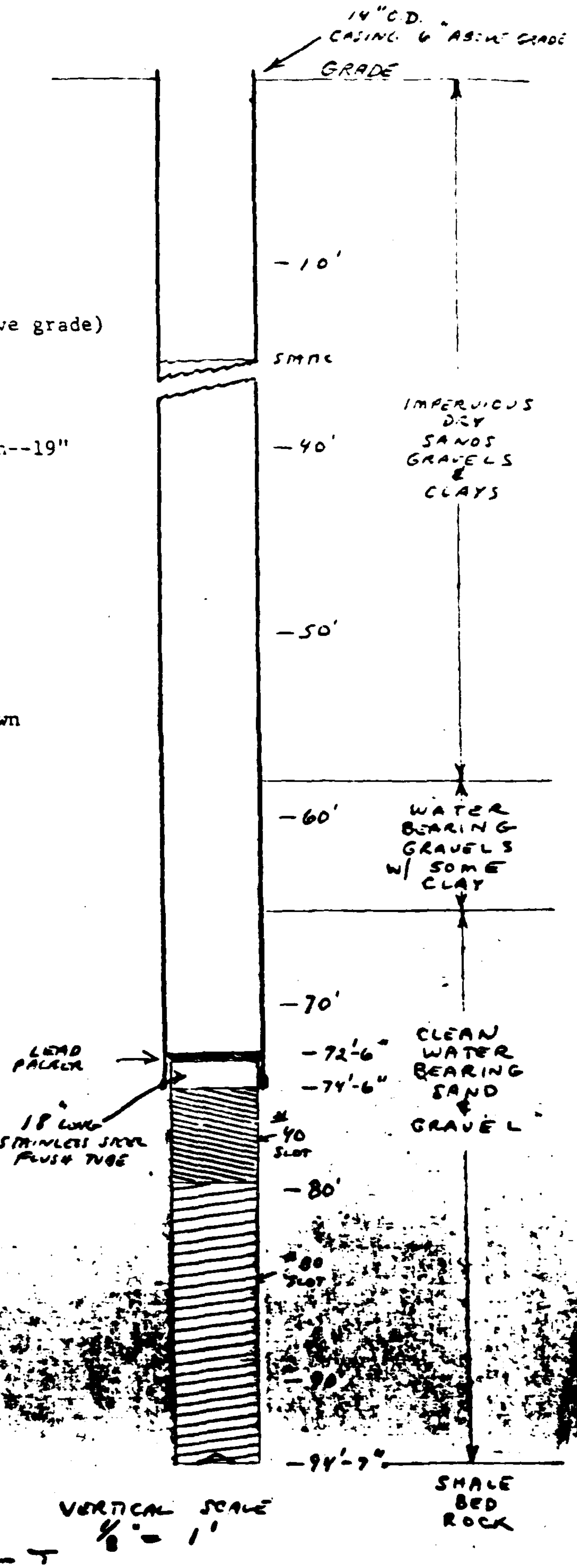
Pump Tested: May 14, 15, 1974
540 GPM at

Specific Capacity: 12.5 GPM per foot of drawdown
Water temperature: 57° Fahrenheit

Hole completed: May 16, 1974

Well log:

0 - 1' top soil under sod
1'-20' sand & gradel (dry)
20'-27' sand w/large gravel (some water)
27'-58' clay & gravels(dry)
58'-65' gravel w/ some clay (some water)
65'-94'7" sand & gravel (water bearing)
94'7" to 95'7" shale bed rock



E.2-6 [illegible]

WATER [illegible] TEST BORINGS
INDUSTRIAL — RESIDENTIAL
WELL SUPPLIES — WATER SYSTEMS — WATER CONDITIONERS
Phone [illegible]

14 MAIN STREET SILVER CREEK, N. Y.

May 14, 15, 1974

RECORD OF WELL TEST PAGE # 1

OWNER: General Electric Corporation LOCATION: Same
Johnson City, New York

WELL # 1 FOREMAN: Douglas Tubbs DURATION OF TEST: 24 Hours

Diameter: 13.25" Depth: 94.5 ft. TYPE OF WELL: Gravel (X) ~~[illegible]~~

Drive Pipe: Yes (X) No ( ) Diameter: 14" OD Length: 75 ft.

Screen: Yes (X) No ( ) Diameter: 11 5/8" I.D. 12 1/2" O.D. Length: 20 Type:

Slot Size: Top 5 ft. # 40 bottom 15 ft. # 80 Overall Length: 22'1"

Top of Bowls @ 75 ft. Length Air Line: XX ft. Discharge Pipe: 8 in.

Orifice Size: 5 in. TYPE PUMP: Turbine (X) ~~[illegible]~~

TYPE DEPTH READING DEVICE: Altitude Gauge ( ) Electrical Water Level (X)

STATIC WATER LEVEL: 15.35 ft. WATER SAMPLE TAKEN BY: Robert L. Ehmke

	TIME	BACK PRESS IN INCHES	ORIFICE	GPM	ALTITUDE	WATER LEVEL	WATER LEVEL IN OBS. HOLE
-14-74	4:55 PM	0	5"	0		STATIC	
	5:00	27	"	510		45'	
	5:30	29	"	530		52'	
	6:00	29	"	530		55'	
	6:30	30	"	540		56'	
	7:00	31	"	548		57'	
	7:30	31	"	548		57'	
	8:00	31	"	548		57'	
	8:30	31	"	548		57'	
	9:00	31	"	548		57'	
	9:30	31	"	548		58'	
	10:00	31	"	548		58'	
	10:30	31	"	548		58'	
	11:00	31	"	548		59'	
	11:30 PM	31	"	548		59'	
	12:00 Midnite	31	"	548		59'	
-15-74	12:30 AM	31	"	548		59'	
	1:00	31	"	548		59'	
	1:30	31	"	548		59'	
	2:00	31	"	548		59'	
	2:30	31	"	548		59'	
	3:00	31	"	548		59'	
	3:30	31	"	548		59'	
	4:00	31	"	548		59'	
	4:30	31	"	548		59'	
	5:00	31	"	548		59'	
	5:30 AM	31	"	548		59'	

REPORT OF WELL TEST PAGE # 2

	TIME	BACK PRESS IN INCHES	ORIFICE	GPM	ALTITUDE	WATER LEVEL	WATER LEVEL IN OBS. HOLE
-15-74	6:00 AM	31	5"	548		59'	
	6:30	31	"	548		59'	
	7:00	31	"	548		59'	
	7:30	31	"	548		59'	
	8:00	31	"	548		59'	
	8:30	31	"	548		59'	
	9:00	31	"	548		59'	
	9:30	31	"	548		59'	
	10:00	31	"	548		59'	
	10:30	31	"	548		59'	
	11:00	31	"	548		59'	
	11:30 AM	31	"	548		59'	
	12:00 Noon	31	"	548		59'	
	12:30 PM	31	"	548		59'	
	1:00	31	"	548		59'	
	1:30	31	"	548		59'	
	2:00	32	"	556		59'6"	
	2:30	32	"	556		59'6"	
	3:00	32	"	556		59'6"	
	3:30	32	"	556		59'6"	
	4:00	33	"	562		60'	
	4:30	33	"	562		60'	
	5:00 PM	33	"	562		60'	

Rebound: From 60 ft. back to 21 ft. in 2 minutes and 15 seconds, after that 2 inches per minute

Specific capacity of this well is 12.5 GPM per foot of drawdown, maximum drawdown being 60 ft. We pumped this well at 75% of drawdown, so possible capacity at time of pumping test would be 750 GPM. We would recommend a 500 GPM pump for this well having a 75 ft. column and shafting in the casing.

GLENDALE ROAD
BINGHAMTON N. Y. 13903
722 - 0030

E.2-8

COSTELLO'S LABORATORY INC.

SUCCESSOR TO NELSON & LAUDER
CHARLES V COSTELLO
CONSULTING SANITARY CHEMIST

LABORATORY FOR
SANITARY & ANALYTICAL
CHEMISTRY

RESULTS OF EXAMINATION OF WATER

LABORATORY NO. C [illegible] COLLECTED BY [illegible] Well Drillers

DATE COLLECTED 5/15/74 RECEIVED 5/15/74 REPORTED [illegible]

PLACE Johnson City, N.Y. (CITY, TOWN, VILLAGE OR HAMLET) COUNTY Broome

SAMPLING POINT General Electric Well #1

OWNER TENANT

BACTERIAL EXAMINATION

BACTERIA PER ML. AGAR 35°C - 24 HRS

TEST FOR COLIFORM GROUP

M. P. N.* / 100 ML

THIS WATER WAS ______ OF A SATISFACTORY SANITARY QUALITY WHEN THE SAMPLE WAS COLLECTED

PHYSICAL EXAMINATION

COLOR 2 TURBIDITY 1 ODOR + COLD Veg + HOT

CHEMICAL EXAMINATION — RESULTS IN PARTS PER MILLION

IRON (FE)	.10	AMMONIA FREE (AS N)		OXYGEN CONSUMED (O)	
MANGANESE (MN)	less than .01 as Rec'd	ALB. AMMONIA (AS N)		CHLORIDES (CL)	33
CARBON DIOXIDE (CO_2)	7	NITRITES (AS N)		TOTAL HARDNESS (AS $CACO_3$)	380
FLOURIDES (F)		NITRATES (AS N)	.10	ALKALINITY (AS $CACO_3$)	265
TOTAL SOLIDS	499	LOSS OF IGNITION		CALCIUM (AS $CACO_3$)	282
BICARBONATES	328	SULFATES	140	MAGNESIUM (AS $CACO_3$)	99
SILICA		COPPER		ELECTROMETRIC PH VALUE	7.3
TOTAL PHOSPHATES		ORTHO PHOSPHATES	-	META PHOSPHATES	
SUSPENDED MATTER		TEMPT AIR °F		TEMPT WATER °F	
DETERGENTS					

NITROGEN CONSTITUENTS: AMMONIA FREE, ALB. AMMONIA, NITRITES, NITRATES

REMARKS:

Charles V. Costello

CHARLES V. COSTELLO

* MOST PROBABLE NUMBER

+1 = VERY SLIGHT 2 = SLIGHT 3 = DISTINCT 4 = DECIDED 5 = EXTREME

EXHIBIT II

CΔTOH Environmental Companies, Inc.
One Industrial Place, Savannah, New York 13146
Phone: 315/365-2891

Project: Test Borings and Observation Well Installation
General Electric Facility Johnson City, NY

Project No.: C364
Boring No.: 1
Surface Elev.:
Groundwater Depth-Casing In: -25'
Below Ground Surf.-Casing Out (hole grouted)

Client: R.J. Martin Consulting Engineers
Date Started: 11/25/85
Date Completed: 11/27/85
Driller: A. Utter
Inspector:

Sheet 1 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
0								Asphalt 0.5'
5	5.0-6.5	1	4	7	9		16	Brown silty coarse to fine sand, little to some gravel.
10	10.0-11.5'	2	3	9	11		20	Brown sandy silt, trace gravel.
15	15.016.5'	3	3	6	4		10	Gray saturated fine sandy silt, trace gravel.
20	20.0-21.5'	4	3	3	3		6	Gray silt, trace clay.
25	25.0-26.5'	5	4	7	4		11	Gray silt, trace clay.
30	30.0-31.5'	6	3	3	5		8	Gray silt, trace clay.
35	35.0-36.5'	7	4	5	5		10	Gray silt, trace clay.
40								

N = No. of blows to drive 2" spoon 12" w/ 140 lb weight 30" each blow.
Casing Type: hollow stem auger

CATOH Environmental Companies, Inc.
One Industrial Place, Savannah, New York 13146
Phone: 315/365-2891

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: 1
Surface Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 11/25/85
Date Completed: 11/27/85
Driller: A. Utter
Inspector:

Groundwater Depth-Casing In: -25'
Below Ground Surf.-Casing Out: (hole grouted)

Sheet 2 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
40	40.0-41.5'	8	3	4	4		8	Gray silt, trace clay.
45	45.0-46.5'	9	4	4	5		9	Gray silt, trace clay.
50	50.0-51.5	10	5	5	7		12	Gray silt, trace to little clay.
55	55.0-56.5'	11	7	8	9		16	Gray silt, trace to little clay.
60	60.0-61.5'	12	4	3	4		7	Gray silt, trace to little clay.
65	65.0-66.5'	13	2	3	2		5	Gray silt, trace clay.
70	70.0-71.5'	14	5	4	5		9	Gray silt, trace clay.
75	75.0-76.5'	15	7	9	10		19	Gray silt, trace clay.
80								79.0'

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

CATOH Environmental Companies, Inc.
One Industrial Place, Savannah, New York 13146
Phone: 315/365-2891

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: 1
Surf. Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 11/25/85
Date Completed: 11/27/85
Driller: A. Utter
Inspector:

Groundwater Depth-Casing In: -2[illegible]
Below Ground Surf.-Casing Out: (hole grouted)

Sheet 3 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
80	80.0-81.5'	16	9	11	12		23	Grav silty fine sand. 82.0'
85	85.0-86.5'	17	8	10	10		20	Gray silt, trace clay. 88.0'
90	90.0-91.0'	18	41	62			103	Gray silt and gravel, little sand, trace clay.
	92.0-93.0'	19	36	34			70	Gray silt and gravel, little sand, trace clay.
95								
	97.5-97.5'	20	100/0				100/0	Boring terminated at 97.5' (refusal)
100								NOTE: Drilled 4¼" I.D. hollow stem auger casing from 0.0-92.0'
								Drilled 4" tricone rotary from 92.0-97.5'
105								Upon completion of boring, installed grout by tremie method from -20.0' to ground level.
110								
115								
120								

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

CATOH Environmental Companies, Inc.
One Industrial Place, Savannah, New York 13146
Phone: 315/365-2891

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: 2
Surface Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 11/27/85
Date Completed:
Driller: A. Utter
Inspector:

Groundwater Depth-Casing In: 20'
Below Ground Surf.-Casing Out:

Sheet 1 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
0								Asphalt 0.5'
								Brown moist to wet coarse to fine gravel and coarse to fine sand, little silt.
5								
								8.0'
10								
15								
20	20.0-22.0	1	19	24			43	Brown moist silty sand, trace gravel, trace clay.
					26	23	49	
25								25.0'
								Brown wet fine sand, trace gravel.
30								30.0'
	30.0-32.0	2	9	8			17	Brown saturated fine sand.
					8	9	17	
35								
40								

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

CATOH Environmental Companies, Inc.
One Industrial Place, Savannah, New York 13146
Phone: 315/365-2891

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: 2
Surface Elev.:

Client: R.J. [illegible]artin Consulting Engineers
Date Started: 11/27/85
Date Completed:
Driller: A. Utter
Inspector:

Groundwater Depth-Casing In: 20'
Below Ground Surf.-Casing Out:

Sheet 2 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
40	40.0-42.0'	3	21	14			35	Brown saturated fine sand, some silt.
					12	17	29	
45								
								47.0'
50	50.0-52.0'	4	21	[illegible]			40	Brown saturated silty [illegible] and gravel. 51.0'
					9	10	19	
55								
60	60.0-62.0'	5	7	9			16	Gray moist silt, [illegible] clay.
					9	8	17	
65								
70	70.0-72.0'	6	11	11			22	Gray saturated silty fine sand.
					10	9	19	
75								
80								

N = No. of blows to drive 2" spoon 12" w/ 140 lb weight 30" each blow.
Casing Type: hollow stem auger

CATOH Environmental Companies, Inc.
One Industrial Place, Savannah, New York 13146
Phone: 315/365-2891

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: 2
Surface Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 11/27/85
Date Completed:
Driller: A. Utter
Inspector:

Groundwater Depth-Casing In:
Below Ground Surf.-Casing Out:

Sheet 3 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
80	80.0-82.0'	7	14	16			30	Brown saturated fine sand.
					17	15	32	
85	85.0-86.5'	8	14	20	19		39	Brown saturated fine sand. 87.0'
90	90.0-90.6'	9	100/.5				100/.5	Gray silty fine sand, trace gravel.
95	94.0-95.0'	10	61	80			141	Gray sand and gravel, some silt.
100	100.0-100.0'	11	70/.0				70/.0	
105								Boring terminated at 104.0' (refusal)
110								
115								
120								

NOTE: Drilled 4½" I.D. hollow stem auger casing from 0.0-90.0'
Drilled 4" tricone, rotary from 90.0'-104.0'

Upon completion of boring, installed grout by tremie method from -20.0 to ground surface.

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

CATOH Environmental Companies, Inc.
One Industrial Place, Savannah, New York 13146
Phone: 315/365-2891

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: 3
Surface Elev.:
Groundwater Depth-Casing in: -20'
Below Ground Surf.-Casing Out:

Client: R.J. Martin Consulting Engineers
Date Started: 12/9/85
Date Completed: 12/11/85
Driller: A. Utter
Inspector:

Sheet 1 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
0								Topsoil 0.25'
								Brown damp ashes, cinders, sand, clay.
5								
								-Fill- 8.0'
10								
15								
	18.0-20.0'	1	32	29			61	Brown wet silty sand, little gravel,
20					41	43	84	trace clay.
25								
								28.0'
	28.0-30.0'	2	32	40			72	Brown saturated gravelly sand.
30					29	30	59	
								33.0'
	33.0-35.0'	3	14	12			26	Brown saturated fine sand, trace silt.
35					14	16	30	
								38.0'
	38.0-40.0'	4	42	51			93	Brown saturated gravelly sand.
40					54	56	110	

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

CATOH Environmental Companies, Inc.
One Industrial Place, Savannah, New York 13146
Phone: 315/365-2891

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: 0364
Boring No.: 3
Surface Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 12/9/85
Date Completed: 12/11/85
Driller: A. Utter
Inspector:

Groundwater Depth-Casing In: -20'
Below Ground Surf.-Casing Out:

Sheet 2 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO	BLOWS ON SAMPLER 0"-6"	6"-12"	12"-18"	18"-24"	N	MATERIAL DESCRIPTION
40								
								43.0'
	43.0-45.0'	5	9	8			17	Brown saturated fine sand, trace
45					9	9	18	gravel, trace silt.
	48.0-50.0'	6	14	12			26	Brown saturated fine sand, trace
					13	14	27	gravel, trace silt. 49.5'
50								
	53.0-55.0'	7	12	16			28	Brown wet fine sand, trace silt.
55					14	16	30	
60	60.0-62.0'	8	13	10			23	Brown wet fine sand, trace silt.
					11	13	24	
65	65.0-67.0'	9	10	11			21	Brown wet fine sand, trace silt.
					11	12	23	
								69.0'
70	70.0-72.0'	10	9	10			19	Brown with gray wet fine sand and silt.
					11	10	21	
75	75.0-77.0'	11	9	9			18	Gray saturated silt, trace fine sand,
					8	9	17	trace clay.
80								

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

CATOH Environmental Companies, Inc.
One Industrial Place, Savannah, New York 13146
Phone: 315/365-2891

Project:	Test Borings and Observation Well Installation General Electric Facility, Johnson City, NY	Project No.:	C364
		Boring No.:	3
Client:	R.J. Martin Consulting Engineers	Surface Elev.:	
Date Started:	12/9/85	Groundwater Depth-Casing In:	-20'
Date Completed:	12/11/85	Below Ground Surf.-Casing Out:	
Driller:	A. Utter		
Inspector:		Sheet	3 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
80	80.0-82.0'	12	10	11			21	Gray saturated silt, trace fine sand,
					34	49	83	trace clay. 82.0'
85	85.0-87.0'	13	41	54			95	Gray wet silty sand and gravel,
					39	51	90	some clay.
90								
	93.0-94.0'	14	61	82			143	Gray wet silty sand and gravel,
								some clay.
95								Boring terminated at 94.0'
100								
105								
110								
115								
120								

NOTE: Drill 4¼" I.D. hollow stem auger casing from 0.0-83.0'. Drilled 4" tricone rotary from 83.0 to 94.0'

Installed 2" dia. stainless steel well screen from -75.0 to -70.0'
2" galvanized riser from -70.0 to -.5'
Manhole and lockable cap at ground surface.
Grouted by tremie method from -20.0' to ground surface.

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

CATOH Environmental Companies, Inc.
16 Drumlin Drive, P.O. Box 560
Weedsport, New York 13166
Phone: 315/834-6603

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: B-4
Surface Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 2/17/86
Date Completed: 2/19/86
Driller: M. Skardinski
Inspector:

Groundwater Depth-Casing In:
Below Ground Surf.-Casing Out:

Sheet 1 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
0								
5								
10	10.0-11.5	1	16	16	18		34	Brown wet coarse to fine gravel and sand, trace clay.
15								
20								
25	25.0-26.5'	2	4	3	4		7	Grey wet fine silty clay, trace of fine gravel and sand.
30								
35	35.0-36.5'	3	2	2	4		6	Grey wet silty fine sand, trace clay.
40								

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

CATOH Environmental Companies, Inc.
16 Drumlin Drive, P.O. Box 560
Weedsport, New York 13166
Phone: 315/834-6603

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: B-4
Surface Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 2/17/86
Date Completed: 2/19/86
Driller: M. Skardinski
Inspector:

Groundwater Depth-Casing In:
Below Ground Surf.-Casing Out:

Sheet 2 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
40								
45	45.0-46.5'	4	3	6	7		13	Grey wet silty fine sand, trace clay.
50								
55	55.0-56.5'	5	2	3	3		6	Grey wet silty fine sand, trace clay.
60								
65	65.0-66.5'	6	3	4	8		12	Grey wet filty fine sand, trace clay. medium to fine sand seam.
70								
75	75.0-76.5	7	6	10	12		22	Grey wet silty fine sand, trace clay.
80								

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

CATOH Environmental Companies, Inc.
16 Drumlin Drive, P.O. Box 560
Weedsport, New York 13166
Phone: 315/834-6603

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: B-4
Surface Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 2/17/86
Date Completed: 2/19/86
Driller: M. Skardinski
Inspector:

Groundwater Depth-Casing In:
Below Ground Surf.-Casing Out:

Sheet 3 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
80								
85	85.0-86.5'	8	7	11	17		28	Grey wet silty fine sand. trace of clay.
90								
95	95.0-96.5'	9	WOR					Grey wet silty fine sand, trace of clay.
100								Boring terminated at 100.5' (auger refusal
105								Upon completion of boring, installed grout by tremie method from -20.0' to ground level.
110								
115								
120								

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

CATOH Environmental Companies, Inc.
16 Drumlin Drive, P.O. Box 560
Weedsport, New York 13166
Phone: 315/834-6603

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: B-5
Surface Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 2/19/86
Date Completed: 2/19/86
Driller: M. Skardinski
Inspector:

Groundwater Depth-Casing In:
Below Ground Surf.-Casing Out:

Sheet 1 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
0								
5								
10	10.0-11.5'	1	17	14	15		29	Brown coarse to fine sand, some fine gravel.
15								
20								
25	25.0-27.0'	2	13	9			22	Brown saturated medium to fine sand,
					9	12	21	little fine gravel.
	27.0-29.0'	3	10	5			15	Grey wet silty clay, tracel gravel.
					5	6	11	
30	30.0-31.5'	4	4	5			9	Grey wet silty clay.
					5	6	11	
35	35.0-36.5'	5	3	4	6		10	Grey wet silty clay, trace sand.
40								

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

CATOH Environmental Companies, Inc.
16 Drumlin Drive, P.O. Box 560
Weedsport, New York 13166
Phone: 315/834-6603

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: B-5
Surface Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 2/19/86
Date Completed: 2/19/86
Driller: M. Skardinski
Inspector:

Groundwater Depth-Casing In:
Below Ground Surf.-Casing Out:

Sheet 2 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
40	40.0-41.5'	6	3	5	7		12	Grey wet silty sand, trace clay.
45	45.0-47.0'	7	9	10			19	Grey wet silty sand, trace clay.
					13	13	26	
50	50.0-51.5'	8	8	9	14		23	Grey wet silty sand, trace clay.
								Grey wet silty sand, trace clay. 56.0'
55	55.0-56.5'	9	11	15	24		39	Grey saturated coarse to fine sand, trace fine gravel, little silt.
	57.0-59.0'	10	27	17			44	Grey saturated silty fine sand, trace gravel.
					14	15	29	
60	60.0-62.0'	11	17	19			36	Grey wet silty fine sand, trace gravel.
					24	29	53	
	62.0-64.0'	12	24	14			38	Grey saturated sandy fine gravel, trace silt.
					17	24	41	
65	64.0-66.0'	13	13	14			27	Grey saturated coarse to fine sand, trace gravel.
					16	12	28	
	66.0-68.0'	14	11	13			24	Sandy gravel layered with silty fine sand. 68.0'
					12	10	22	
	68.0-70.0'	15	4	3			7	Grey silt , trace clay.
70					3	5	8	
	70.0-72.0'	16	4	5			9	Grey silt , little clay.
					4	6	10	
75	75.0-77.0'	17	3	4			7	Grey silt , little clay.
					4	6	10	
80								

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

CATOH Environmental Companies, Inc.
16 Drumlin Drive, P.O. Box 560
Weedsport, New York 13166
Phone: 315/834-6603

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: B-5
Surface Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 2/19/86
Date Completed: 2/19/86
Driller: M. Skardinski
Inspector:

Groundwater Depth-Casing In:
Below Ground Surf.-Casing Out:

Sheet 3 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
80	80.0-82.0'	18	WOR	WOR				Grey silt, little clay.
					WOR	WOR		
85	85.0-87.0'	19	5	15			20	Grey silt, little clay.
					21	26	47	
90	90.0-92.0'	20	8	7			15	Grey silt, little clay.
					9	13	22	
95								Boring terminated at 94.0' (refusal)
100								
105								
110								
115								
120								

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

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Weedsport, New York 13166
Phone: 315/834-6603

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: B-6
Client: R.J. Martin Consulting Engineers
Surface Elev.:
Date Started: 3/31/86
Groundwater Depth-Casing In: 25.0'
Date Completed: 4/3/86
Below Ground Surf.-Casing Out: 22.0'
Driller: A. Utter
Inspector:
Sheet 1 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
0								Black top 0.3'
5								
10								
15								
20								
25								
30	30.0-32.0'	1	20	19			39	Brown saturated sandy medium to fine gravel.
					21	18	39	
35								
40								

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

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Weedsport, New York 13166
Phone: 315/834-6603

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: B-6
Surface Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 3/31/86
Date Completed: 4/3/86
Driller: A. Utter
Inspector:

Groundwater Depth-Casing In: 25.0'
Below Ground Surf.-Casing Out: 22.0'

Sheet 2 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
40	40.0-42.0'	2	26	20			46	Brown saturated sandy medium to fine gravel.
					19	15	34	
45								45.0'
50	50.0-52.0'	3	24	22			46	Brown saturated medium to fine sand.
					20	21	41	
55								
								57.0'
	59.0-61.0'	4	29	28			57	Brown wet silty gravel, little sand, few cobbles.
60					28	27	55	
								63.0'
65								
	68.0-70.0'	5	19	18			37	Grey saturated silty fine sand.
70					18	21	39	
75								
								77.0'
	78.0-80.0'	6	41	62			103	Grey wet sandy gravel, little silt and clay.
80					68	74	142	

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

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Weedsport, New York 13166
Phone: 315/834-6603

Project: Test Borings and Observation Well Installation
General Elctric Facility, Johnson City, NY

Project No.: C364
Boring No.: B-6
Surface Elev.:
Groundwater Depth-Casing In: 25.0'
Below Ground Surf.-Casing Out: 22.0'

Client: R.J. Martin Consulting Engineers
Date Started: 3/31/86
Date Completed: 4/3/86
Driller: A. Utter
Inspector:

Sheet 3 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
80								
85								
	88.0-89.0'	7	62	100			162	Grey damp sandy gravel, some silt.
90								
95								
								98.0'
	98.0-98.2'	8	140/.2				140/.2	Grey shale.
100								Boring terminated at 98.2'
105								
110								
115								
120								

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

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Phone: 315/834-6603

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: #7
Surface Elev.:

Client: R.J. Martin Consulting Engineers

Date Started: 5/6/86

Date Completed: 5/8/86

Driller: A. Utter

Inspector:

Groundwater Depth-Casing In: 21.0'
Below Ground Surf.-Casing Out:

Sheet 1 of 2

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
0								Asphalt 0.25'
								Brown silty fine sand, trace clay
5								
								8.0'
10								
15								
20								
25	25.0-27.0'	1	21	20			41	Brown saturated coarse to fine sand
					16	14	30	and medium to fine gravel, trace silt.
30	30.0-32.0'	2	17	16			33	Brown saturated coarse to fine sand
					15	19	34	and medium to fine gravel, trace silt.
35								35.0'
	35.0-37.0'	3	19	16			35	Brown saturated medium to fine gravel,
					14	12	26	and fine sand, trace silt.
40								

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.

Casing Type: hollow stem auger

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Weedsport, New York 13166
Phone: 315/834-6603

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: 67
Surface Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 5/6/86
Date Completed: 5/8/86
Driller: A. Utter
Inspector:

Groundwater Depth-Casing In: 21.0'
Below Ground Surf.-Casing Out:

Sheet 2 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
40	40.0-42.0'	4	17	20			37	Brown wet silty sand, little gravel.
					21	23	44	
45	45.0-47.0'	5	19	18			37	Brown wet silty sand, little gravel.
					20	22	42	
50	50.0-52.0'	6	24	27			51	Brown wet sandy silt, little gravel.
					30	31	61	
55	55.0-57.0'	7	19	22			41	Brown wet silty sand and gravel.
					29	28	57	
60	60.0-62.0'	8	14	16			30	Brown wet silty sand and gravel.
					19	20	39	
65	65.0-67.0'	9	21	19			40	Brown wet silty sand, little gravel.
					19	22	41	
70								70.0'
	70.0-72.0'	10	29	34			63	Brown moist silty sand, trace gravel.
					39	42	81	
75	75.0-77.0'	11	30	29			59	Brown moist silty sand, little gravel.
					28	36	64	
80								

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

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Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: 7
Surface Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 5/6/86
Date Completed: 5/8/86
Driller: A. Utter
Inspector:

Groundwater Depth-Casing In: 21.0'
Below Ground Surf.-Casing Out:

Sheet 3 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
80	80.0-82.0'	12	19	21			40	Brown moist silty sand, trace gravel.
					20	26	46	
								85.0'
85	85.0-87.0'	13	35	47			82	Grey moist clayey silt, little sand
					60	90	150	and gra·el.
								Boring erminated at 87.0'
90								NOTE: Upon completion of boring, abandoned drill hole with cement/bentonite grout.
95								
100								
105								
110								
115								
120								

N = No. of blows to drive 2" spoon 12" w/ 140 lb. weight 30" each blow.
Casing Type: hollow stem auger

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Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: ~~7~~ 8
Surface Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 5/8/86
Date Completed: 5/12/86
Driller: A. Utter
Inspector:

Groundwater Depth-Casing In: 18.0'
Below Ground Surf.-Casing Out:

Sheet 1 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
0								Asphalt 0.25'
								Brown damp sandy gravel.
5								
10								
15								
20								
								23.0'
25	25.0-27.0'	1	2	1			3	Grey wet silt, trace clay.
					1	3	4	
30	30.0-32.0'	2	3	3			6	Grey wet silt, trace clay.
					4	4	8	
35	35.0-37.0'	3	4	3			7	Grey wet silt, trace clay. 36.0'
					5	5	10	Brown moist coarse to fine sand, little medium to fine gravel, trace silt.
40								

N = No. of blows to drive 2" spoon 12" w/ 300 lb. weight 24" each blow.
Casing Type: hollow stem auger

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Phone: 315/834-6603

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: # 8
Surface Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 5/8/86
Date Completed: 5/12/86
Driller: A. Utter
Inspector:

Groundwater Depth-Casing In: 18.0'
Below Ground Surf.-Casing Out:

Sheet 2 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"-6"	6"-12"	12"-18"	18"-24"	N	MATERIAL DESCRIPTION
40	40.0-42.0'	4	8	10			18	Brown moist coarse to fine sand, little
					14	16	30	medium to fine gravel, trace silt.
45	45.0-47.0'	5	10	14			24	Brown wet coarse to fine sand, trace
					17	16	33	gravel, trace silt.
								50.0'
50	50.0-52.0'	6	7	8			15	Brown saturated coarse to fine sand,
					8	9	17	trace gravel.
	52.0-54.0'	7	9	10			19	Brown moist medium to fine sand.
					10	9	19	
55	55.0-57.0'	8	4	4			8	Brown wet coarse to fine sand, little
					5	6	11	gravel.
60	60.0-62.0'	9	5	7			12	Brown wet silty coarse to fine sand,
					6	6	12	trace gravel.
								65.0'
65	65.0-67.0'	10	8	7			15	Brown wet silty fine sand.
					8	9	17	
								70.0'
70	70.0-72.0'	11	6	6			12	Grey wet silt.
					7	8	15	
75	75.0-77.0'	12	6	6			12	Grey wet silt.
					6	5	11	
80								

N = No. of blows to drive 2" spoon 12" w/ 300 lb. weight 24" each blow.
Casing Type: bollow stem auger

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Phone: 315/834-6603

Project: Test Borings and Observation Well Installation
General Electric Facility, Johnson City, NY

Project No.: C364
Boring No.: 78
Surface Elev.:

Client: R.J. Martin Consulting Engineers
Date Started: 5/8/86
Date Completed: 5/12/86
Driller: A. Utter
Inspector:

Groundwater Depth-Casing In: 18.0'
Below Ground Surf.-Casing Out:

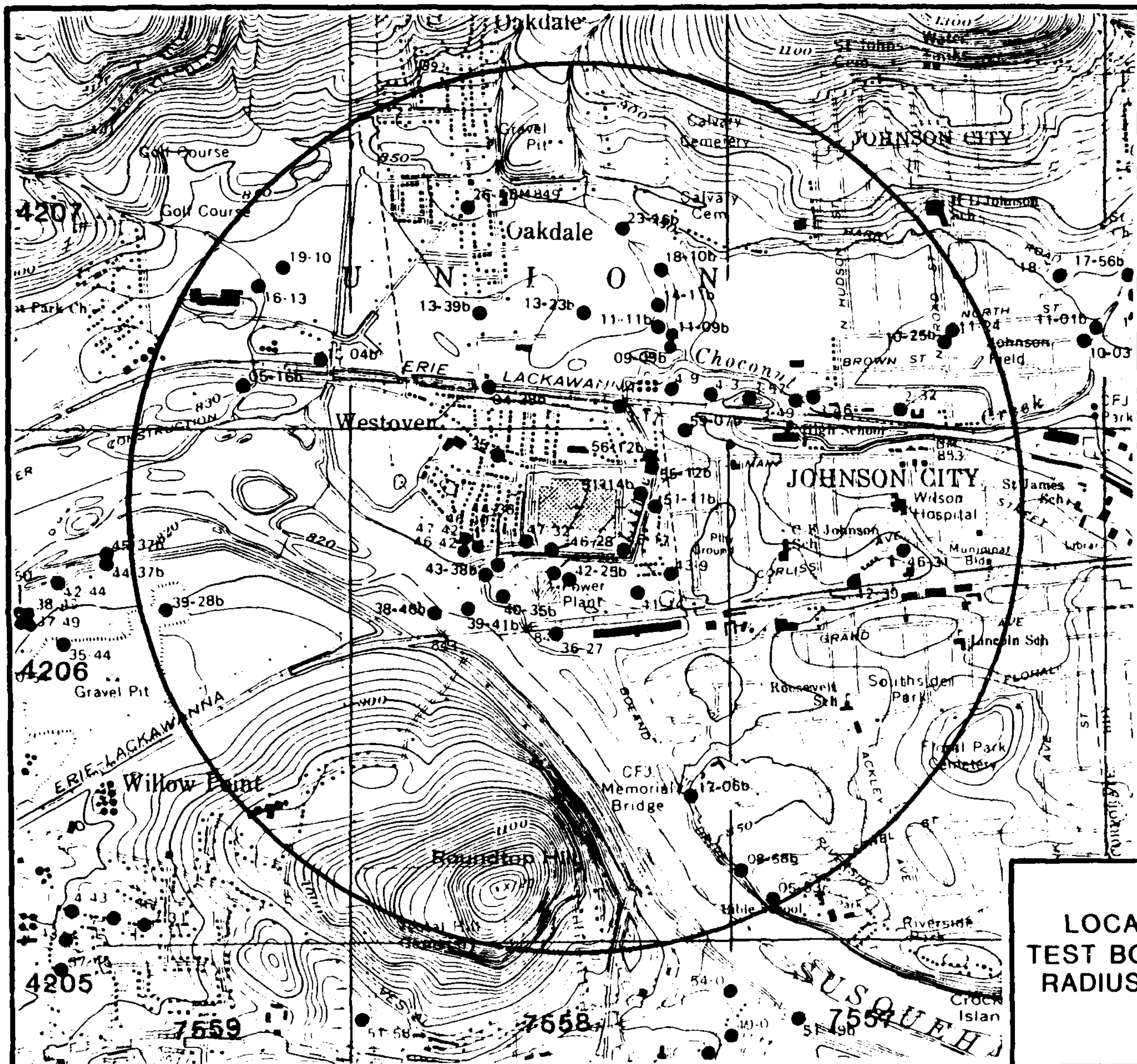
Sheet 3 of 3

DEPTH	SAMPLE DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	MATERIAL DESCRIPTION
80	80.0-82.0'	13	7	7			14	Grey wet silt, trace very fine sand.
					9	9	18	
85	85.0-87.0'	14	7	9			16	Grey moist silt, little medium to
					10	11	21	fine gravel. 87.0'
90	90.0-02.0'	15	28	25			53	Grey moist silty coarse sand, trace
					25	25	50	clay.
95	95.0-97.0'	16	60	90			150	Grey moist silt, some sand and gravel.
								Boring terminated at 96.0' (Refusal)
								NOTE: Upon completion of drilling,
								abandoned borehole with cement/
100								bentonite grout.
105								
110								
115								
120								

N = No. of blows to drive 2" spoon 12" w/ 300 lb. weight 24" each blow.
Casing Type: hollow stem auger

APPENDIX E.3

LOGS OF WELLS IN SURROUNDING AREA



LEGEND

3-43 ● WELL LOCATION AND NUMBER

00-19b ● TEST BORING LOCATION AND NUMBER

1000 0 1000 2000

SCALE (FEET)

1 0

SCALE (MILE)

FIGURE E.3-1

LOCATIONS OF WELLS AND TEST BORINGS WITHIN A 1-MILE RADIUS OF JOHNSON CITY, NY

USAF BASE NO. 59
JOHNSON CITY, NY

FRED C. HART ASSOCIATES, INC.

SOURCE: USGS, BULLETIN 69, PLATE 2, 1972

TABLE E.3-1

LOGS OF TEST BORINGS

4206 05 7557 53 Altitude 875 ft. Log by Giles Drilling Corporation
- 0- 25 ft Brown clay silt, some sand, some gravel and small boulders (Till - ADR)

4206 08 7557 58 Altitude 849 ft. Log by Giles Drilling Corporation
- 0- 7 ft Medium brown sand and gravel, trace silt
- 7- 23 ft Medium brown sand and gravel, trace silt, small boulders
- 23- 25 ft Medium brown sand and gravel, some silt

4206 17 7558 06 Altitude 835 ft. Log by Giles Drilling Corporation
- 0- 15 ft Medium brown sand and gravel, trace silt
- 15- 25 ft Gray clay silt, some medium sand, some gravel (Till - ADR)

4206 59 7558 07 Altitude 842 ft. Log from records of N.Y. Dept. of Transportation
- 0- 35 ft Sand and gravel, trace of silt, loose, brown
- 35- 50 ft Silt, trace of sand, medium-firm, brown
- 50- 76 ft Silt, some clay; silt and clay, medium-firm to soft, plastic, gray
- 76-105 ft Silt, trace sand and clay; silt, some clay, trace sand; medium-firm, plastic, gray
- 105-107 ft Sand and gravel, some clay and silt; loose, plastic, gray

4206 51 7558 11 Altitude 834 ft. Log from records of N.Y. Dept. of Transportation
- 0- 15 ft Sand and gravel, traces silt and roots; loose, brown
- 15- 30 ft Silt, soft, plastic, gray
- 30- 40 ft Fine sand, some silt; silt, some fine sand; gray
- 40- 50 ft Fine sand, trace gravel at top, loose, gray
- 50- 60 ft Silt, medium-firm, gray
- 60- 75 ft Interbedded coarse and fine sand, trace silt, loose
- 75- 80 ft Fine sand, some silt, compact, gray-brown
- 80- 95 ft Coarse sand, some silt and angular stone, compact, slightly plastic, gray

4206 55 7558 12 Altitude 834 ft. Log from records of N.Y. Dept. of Transportation
- 0- 16 ft Sand and gravel, trace silt, loose, brown
- 16- 22 ft Sand and gravel, some silt, trace roots, loose, gray
- 22- 32 ft Sand, traces silt and gravel, loose, gray
- 32- 38 ft Sand and gravel, some silt, loose, gray
- 38- 60 ft Sand and gravel, trace silt, loose, gray
- 60- 87 ft Sand and gravel, alternating some to trace silt, loose to compact, gray
- 87- 98 ft Sand, trace silt; sand and silt, trace clay; loose to medium-firm, brown, slightly plastic
- 98-110 ft Sand and gravel, trace silt and clay, slightly plastic, compact, gray

4206 56 7558 12 Altitude 833 ft. Log from records of N.Y. Dept. of Transportation
- 0- 35 ft Sand and gravel, trace of silt (some silt 15-20), loose, brown (0-20) to gray
- 35- 45 ft Sand, trace of silt, compact, gray
- 45- 95 ft Silt, some sand; silt, some clay, trace of sand; silt, traces of sand and clay; gray (45-55) to brown; soft to medium-firm
- 95-100 ft Sand, trace of silt, loose, gray
- 100-105 ft Sand, some gravel and silt, compact, gray
- 105-107 ft Gravel, some sand and silt, loose, gray

4206 42 7558 25 Altitude about 832 ft. Log by Acker Drill Company
- 0- 14 ft Cinders
- 14- 19 ft Sand, gravel and clay
- 19- 29 ft Sand, gravel, wet
- 29- 34 ft Sand, gravel, and clay
- 34- 44 ft Coarse sand
- 44- 46 ft Blue clay and gravel
- 46- 48 ft Sandstone and slate
- 48- 50 ft Clay and shale

Note: Other nearby borings suggest rock should be deeper than 46 ft here. If not rock, the material 46-50 ft is probably till - ADR

4206 40 7558 35 Altitude 830 ft. Log by Giles Drilling Corporation
- 0- 9 ft Fill
- 9- 13 ft Brown silt
- 13- 18 ft Brown fine sand, some silt
- 18- 30 ft Gray coarse to fine sand and gravel
- 30- 47 ft Fine gray sand, trace silt
- 47- 52 ft Gray silt and fine sand

4206 43 7558 38 Altitude 824 ft. Log by Giles Drilling Corporation
- 0- 6 ft Fill: black and brown sand, gravel
- 6- 10 ft Brown fine to medium sand
- 10- 20 ft Brown fine to medium sand, gravel
- 20- 30 ft Gray fine to coarse sand, gravel, and silt
- 30- 47 ft Gray fine to coarse sand, some silt
- 47- 50 ft Brown fine to medium sand, some silt

4206 39 7558 41 Altitude 816± ft. Log by Giles Drilling Corporation
- 0- 8 ft Water
- 8- 12 ft Brown fine to medium sand, trace silt, some gravel
- 12- 28 ft Gray fine sand, some silt
- 28- 33 ft Gray fine sand, small gravel, some silt
- 33- 38 ft Gray fine sand, some silt
- 38- 42 ft Dark gray fine sand, some silt

4206 38 7558 46 Altitude 816 ft. Log by Giles Drilling Corporation
- 0- 12 ft Water
- 12- 16 ft Brown fine to medium sand, some silt, some gravel
- 16- 32 ft Gray fine sand, some silt
- 32- 37 ft Gray fine sand and silt
- 37- 49 ft Gray fine sand, some silt

4206 39 7559 28 Altitude about 830 (±10 ft). Log by Stewart Brothers, Inc.
- 0- 7 ft Gravel, medium to coarse, gray
- 7- 12 ft Clay, yellow
- 12- 28 ft Clay, blue
- 28- 62 ft Clay, gray
- 62-108 ft Silt, gray
- at 108 ft Rock

4207 10 7557 25 Altitude 840 ft. Log from records of New York Dept. of Transportation
- 0- 2 ft Silt, trace sand and organic; soft; brown
- 2- 8 ft Silt, some clay; trace sand; soft, brown
- 8- 15 ft Silt, some fine sand, trace clay; layered; soft; brown
- 15- 39 ft Fine to coarse sand, some small gravel and silt; medium-compact; brown
- 39- 52 ft Silt and clay, some sand; layered; loose-compact; brown
- 52- 91 ft Silt, fine to coarse sand, and small gravel; medium-compact; brown

Note:

$\underbrace{4207\ 13}_{\text{Latitude}}$ $\underbrace{7558\ 39}_{\text{Longitude}}$ = Test Boring/Well Location and Numbering System.

Source: USGS, Bulletin 69, 1972.

TABLE E.3-1

LOGS OF TEST BORINGS

4207 09 7558 09 Altitude 831 ft. Log from records of New York Dept. of Transportation
- 0- 15 ft Sand, some silt; silt, some sand; loose (top) to compact, brown
- 15- 55 ft Sand and gravel; trace silt except some silt 30-40; loose, gray
- 55- 65 ft Gravel, some sand and silt; gravel, some silt; loose; gray
- 65- 93 ft Sand and gravel, trace silt, loose, gray

4207 11 7558 09 Altitude 831 ft. Log from records of New York Dept. of Transportation
- 0- 8 ft Silt, traces sand, wood, and organic matter
- 8- 15 ft Sand, traces silt, organic matter, and gravel
- 15- 40 ft Gravel, some sand, trace silt, loose, gray
- 40- 61 ft Sand, trace silt; silt, trace sand and clay, loose to medium, gray
- 61- 66 ft Sand and silt, some gravel, medium firm, gray
- 66- 76 ft Sand and gravel, trace silt, loose, gray
- 76- 81 ft Sand, trace silt, loose, gray
- 81-102 ft Sand and gravel, trace silt, loose, gray

4207 18 7558 10 Altitude 830 ft. Log from records of New York Dept. of Transportation
- 0- 8 ft Silt, trace sand and organic, brown to gray, hard
- 8- 20 ft Sand and gravel, trace silt, loose, gray
- 20- 35 ft Sand, some silt, loose, brown
- 35- 45 ft Sand, some silt, trace clay, slightly plastic, gray
- 45- 55 ft Silt, some sand, gray
- 55-107 ft Gravel and sand, trace silt, loose, gray

4207 11 7558 11 Altitude 830 ft. Log from records of New York Dept. of Transportation
- 0- 11 ft Silt, some sand, trace gravel, medium-firm, brown
- 11- 38 ft Gravel, some sand, trace silt, loose, brown
- 38- 60 ft Sand, some silt, traces of gravel, medium-firm, gray
- 60- 70 ft Silt, some to trace sand, trace clay, slightly plastic, gray
- 70- 87 ft Silt, traces sand and gravel, gray (top) to brown
- 87- 92 ft Sand, some silt, compact, brown
- 92- 98 ft Sand and silt, trace clay, slightly plastic, brown
- 98-103 ft Sand, some silt, traces gravel and clay, slightly plastic, gray
- 103-109 ft Sand, trace silt, loose, gray
- 109-114 ft Gravel, trace sand and silt, loose, gray
- 114-119 ft Sand, traces silt and gravel, loose, brown
- 119-125 ft Sand, trace silt, loose, brown
- 125-136 ft Gravel, some sand, trace silt, loose, brown
- 136-141 ft Sand, trace gravel, loose, gray
- 141-151 ft Gravel and sand, trace silt, compact (top) to loose, gray; lost water at 151 ft

4207 14 7558 11 Altitude 830 ft. Log from records of New York Dept. of Transportation
- 0- 10 ft Silt, trace sand (top) to sand, trace silt, brown-gray
- 10- 15 ft Sand, some gravel, trace silt, loose, gray-brown
- 15- 30 ft Silt, some sand, loose, brown
- 30- 35 ft Sand, trace silt, loose, brown
- 35- 55 ft Gravel, some sand, trace silt, loose, brown
- 55- 60 ft Sand, some gravel and silt, trace clay, loose, gray-brown, slightly plastic
- 60- 65 ft Sand, traces silt and clay, loose, slightly plastic, gray
- 65- 86 ft Silt, sandy at base, gray
- 86- 91 ft Silt and sand, some gravel, loose, gray
- 91-113 ft Sand and gravel, trace silt, loose, gray

4207 23 7558 16 Altitude 835 ft. Log from records of New York Dept. of Transportation
- 0- 10 ft Silt, some sand, gravel, organic; sand, some silt
- 10- 40 ft Gravel, some sand, trace silt, loose, brown
- 40- 45 ft Gravel, some silt and sand, compact, brown
- 45- 62 ft Gravel, some sand, trace clay, gray; boulders 53-55 and 56-60 (Till? - ADR)

4207 13 7558 23 Altitude 830 ft. Log from records of New York Dept. of Transportation
- 0- 12 ft Silt, some to trace sand and clay; soft; brown
- 12- 17 ft Silt, some sand and gravel; compact; brown
- 17- 40 ft Sand and gravel, some silt; firm; brown
- 40- 42 ft Fine to coarse sand; firm; brown
- 42- 63 ft Silt and sand, some gravel; medium; gray
- 63- 84 ft Silt, trace clay; firm; gray
- 84-101 ft Silt and sand, some gravel, trace clay, gray (Till? - ADR)

4207 13 7558 39 Altitude 827 ft. Log from sample study by A.D. Randall, U.S. Geological Survey
- 0- 7 ft Silt, a little clay, a few rounded pebbles, 5Y4/1 (top), mottled 10YR5/4 (bottom); non-calcareous
- 7- 12 ft Gravel, sandy, silty, 10YR5/4, compact, non-calcareous; bright, pepper-and-salt sand with chert, gneiss, quartzite, and local shale in pebble sizes
- 12- 55 ft Gravel and coarse to very coarse sand, a little medium to fine sand (except 50% medium to fine sand at 25 ft), slightly silty to silt-free; calcareous, bright, numerous exotics including blue and gray limestone; 10YR4/2
- 55-109 ft Silt, some clay below 65 ft, 5Y5/2, calcareous; interbedded thin reddish clay layers noted below 85 ft, thin gravel layers 105-109 ft
- 109-116 ft Gravel, and very coarse to fine sand, slightly to moderately silty, calcareous; 5Y-5GY4/1; layers of very silty medium to very fine sand and very silty granule-pebble gravel noted; sand is nearly all shale grains, with a few limestone and quartz grains

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Note:

4207 13 (Latitude) 7558 39 (Longitude) = Test Boring/Well Location and Numbering System.

Source: USGS, Bulletin 69, 1972.

TABLE E.3-1
LOGS OF TEST BORINGS

4207 13 7559 04 Altitude 827 ft. Log from records of New York Dept. of Transportation

- 0- 2 ft Silt, trace clay, organic, and gravel; soft; brown
- 2- 10 ft Silt, some fine sand, trace fine gravel and clay; soft; brown
- 10- 13 ft Silt, some sand; soft; brown
- 13- 20 ft Fine-medium sand, some silt, trace clay; soft; gray
- 20- 24 ft Silt, some sand; soft; gray
- 24- 52 ft Silt, sand, gravel; medium; brown
- 52- 77 ft Silt, some to trace sand and clay; compact; brown
- 77-101 ft Silt and sand, some gravel, trace clay; compact; brown

4207 05 7559 16 Altitude 827 ft. Log from sample study by A.D. Randall, U.S. Geological Survey

- 0- 14 ft Silt, non-calcareous, moderate-yellow-brown 10YR5/4, in part mottled or streaked with dark-yellow-brown 10YR3/2 near top
- 14- 22 ft Silt and very fine sand, non-calcareous, 5Y5/2 - 10YR5/4; thin layer medium to fine sand
- 22- 48 ft Gravel, some rounded pebbles larger than 1 inch, sandy below 40 ft, somewhat silty 30-40 ft, but very little silt 22-30 and 40-48 ft; calcareous; 5Y-10YR5/2. Pebble counts: 16 local/4 ls/7 other
- 48- 52 ft Sand, medium to fine, no silt, highly calcareous, 5YR-10YR4/2
- 52- 60 ft Gravel, some sand and silt, highly calcareous, blue limestone present
- 60- 69 ft Sand, coarse to medium, some fine sand at top, very little silt, except for a few streaks(?) of silty sand; highly calcareous
- 69- 72 ft Gravel, sandy and very silty, calcareous, blue limestone present
- 72- 82 ft Sand, very coarse to fine, a few pebbles, probably alternating thin slightly silty and very silty layers
- 82-100 ft Gravel, sandy and silty to very silty, calcareous 5Y-5GY5/1. Pebbles generally rounded, almost but not quite all of local rocks. Samples at 85 and 95 ft so compact and coherent as to strongly resemble till
- 100-105 ft Unable to get good sample. Presumably same as above, but perhaps cleaner
- 105-118 ft Chiefly till: angular stones, almost but not quite all local rocks, in matrix of silt with some sand, compact, coherent. One thin layer of silty vfs. Sand and silt are calcareous, color light olive to greenish gray (5Y-5GY5/1)
- 118-121 ft Gravelly, semi-sorted till(?) - angular stones, sand, and silt, almost but not quite all local rocks, calcareous, 5Y-5GY4/1. Sample poorly sorted but not coherent and less silty than those above

Note:

$\underbrace{\text{4207 13}}_{\text{Latitude}}$ $\underbrace{\text{7558 39}}_{\text{Longitude}}$ = Test Boring/Well Location and Numbering System.

Source: USGS, Bulletin 69, 1972.

TABLE E.3-1

LOGS OF WELL BORINGS

4206 46 7557 31 Altitude 847 ft. Log from records of Long Island Water Supply Co., driller.

0-20 ft	Not reported
20-40 ft	Sand
40-55 ft	Sand and small gravel
55-60 ft	Large gravel

4206 42 7557 39 Altitude 841 ft. Log from sample study by Ted Arnow, U.S. Geol. Survey. Analysis by field kit.

0- 4 ft	Fill: ashes
4-25 ft	Clay, sand, and gravel, brown
25-31 ft	Clay, sand, and gravel, blue-grey
31-38 ft	Clay and gravel, blue, "hardpan"; drilled very hard, hole remained open 5 ft ahead of casing
38-42 ft	Clay, sand, and gravel; blue; softer than 30-37 ft unit. Hardness 320, alkalinity 170, chloride 38 mg/l
42-44 ft	Gravel, coarse, some gray clay, water-bearing
44-— ft	Gravel and blue clay, "hardpan?"

4207 11 7557 24 Altitude 840 ft. Log from records of Kelly Well Drilling Co., driller.

0-11 ft	Clay, gravel
11-14 ft	Gravel
14-16 ft	Clay
16-30 ft	Sand, gravel
30-47 ft	Clay, sandy, blue, and stones
47-48 ft	Hardpan
48-56 ft	Gravel, hard, and stones
56-75 ft	Sand, gravel, stones, and boulders
75-82 ft	Gravel, hard, clay, and boulders

4207 02 7557 32 Altitude [illegible] ft. Log from records of C.W. Lauman, Inc., driller.

0- 3 ft	Fill
3-16 ft	Brown clay
16-44 ft	Sand, grits, gravel, large boulders
44-55 ft	Fine and coarse sand, grits, silty clay
55-67 ft	Fine to coarse sand and grits
67-74 ft	Fine to coarse sand, grits, gravel, and lumps of clay
74-78 ft	Fine to coarse sand, grits, gravel and stones
78-85 ft	Fine sand, some grits, silt and clay
85-86 ft	Shale
86-99 ft	Fine to coarse sand, grits, gravel and boulders

4207 03 7557 46 Altitude 838 ft. Log from records of C.W. Lauman, Inc., driller.

0- 10 ft	Fill
10- 11 ft	Dark gray clay
11- 18 ft	Coarse sand, grits, gravel, and boulders
18- 22 ft	Coarse dark gray sand
22- 27 ft	Silt
27- 54 ft	Coarse sand, grits, gravel, and boulders
54- 63 ft	Boulders, stones, shale, and rock
63- 75 ft	Gravel and sand
75- 83 ft	Medium to coarse sand
83- 87 ft	Sand and stone, little clay
87- 92 ft	Medium to coarse sand, gravel, some clay
92-108 ft	Medium to coarse sand and gravel
108-118 ft	Some clay and heavy gravel

4207 03 7557 49 Altitude 833 ft. Log from sample study by G. Sidney Fox of Leggette, Brashears and Graham.

0- 5 ft	Silt, brown, with fine sand and some fine gravel
5- 20 ft	Silt, brown, with fine sand and fine to medium gravel
20- 30 ft	Silt, and sand, fine, gray, with a few coarse sand grains and a few pebbles
30- 50 ft	Clay and silt, sticky, gray
50- 55 ft	Gravel, chopped up, silty and clayey, gray
55- 60 ft	Sand and gravel, medium to coarse, gray and red
60- 65 ft	Sand, medium to coarse, gray and red
65- 75 ft	Same, with fine to medium gravel
75- 85 ft	Gravel, fine to medium, gray, some sand, a little silt
85- 90 ft	Gravel, fine to coarse, slightly silty, gray and red
90- 95 ft	Gravel, fine to coarse, silty, gray
95-100 ft	Sand, coarse, and gravel, fine, gray and red
100-116 ft	Same, with chopped up gravel
116-119 ft	Shale, soft, gray

4207 03 7557 57 Altitude 838 ft. Log from sample study by G. Sidney Fox of Leggette, Brashears and Graham.

0- 5 ft	Silt and gravel, fine, brown, with a few sand grains
5- 10 ft	Sand, fine, silty, brown
10- 15 ft	Clay and silt, brown, with a few coarse sand grains
15- 35 ft	Clay and silt, sticky, gray

Note:

$\underbrace{\text{4207 13}}_{\text{Latitude}}$ $\underbrace{\text{7558 39}}_{\text{Longitude}}$ = Test Boring/Well Location and Numbering System.

Source: USGS, Bulletin 69, 1972.

TABLE E.3-1

LOGS OF WELL BORINGS

4207 04 7558 03 Altitude 831 ft. Log from sample study by J. Sidney Fox of Leggette, Brashears and Graham.

0- 5 ft	Clay, brown (fill)
5- 10 ft	Clay, silty, brown, some gravel, very little sand
10- 27 ft	Clay, gray
27- 30 ft	Clay, silty, gray, with a little gravel
30- 35 ft	Silt, sandy, brown (soupy)
35- 40 ft	Same, with much gravel
40- 45 ft	Sand, reddish brown, silty
45- 50 ft	No sample
50- 55 ft	Sand, medium to coarse, and gravel, gray, silty
55- 60 ft	Sand, medium to coarse, very little gravel, gray, slightly silty
60- 70 ft	Same, but very little or no silt
70- 80 ft	Sand, fine to coarse, and gravel, medium, red and gray, very little silt
80- 90 ft	Sand, fine to medium, silty, brown and gray, a few medium gravel pebbles
90- 95 ft	Sand, fine, red and gray
95-100 ft	Sand, medium to coarse, red and gray, a few fine gravel pebbles
100-105 ft	Sand, fine to coarse, and gravel, fine, gray, some brown silt
105-110 ft	Same, no silt
110-115 ft	Sand, medium to coarse, and gravel, fine, gray

4207 04 7558 29 Altitude 830 ft. Log from sample study by J. Sidney Fox of Leggette, Brashears and Graham.

0- 5 ft	Loam, brown, with very few sand grains
5- 10 ft	Clay and silt, brown, with some gravel and very few sand grains
10- 15 ft	Sand, fine, clayey and silty, with a couple of small pebbles
15- 20 ft	Same, with chunks of brown clay, and medium gravel
20- 30 ft	Sand, fine to medium, with a little brown silt, and some reddish brown medium gravel
30- 35 ft	Silt, grayish brown, with very few sand grains and a few pebbles
35- 40 ft	Sand. very fine, very silty, grayish brown
40- 45 ft	Silt, grayish brown, with very fine sand
45- 50 ft	Gravel, silty, grayish brown
50- 55 ft	Sand, fine to medium, gray, and small gravel, very silty
55- 80 ft	Sand, coarse, and gravel, fine, gray, slightly silty top 10 feet
80- 85 ft	Sand, coarse, and gravel, fine to coarse, gray
85- 90 ft	Sand, coarse, and gravel, fine, gray
90-100 ft	Sand, coarse, and gravel, fine, gray, extremely silty, lumps of clay in lower part
100-105 ft	Sand, medium, reddish gray, very slightly silty
105-110 ft	Sand, fine, reddish grey, very slightly silty
110-120 ft	Sand, medium to coarse, reddish gray, silty
120-125 ft	Gravel and clay, gray
125-137 ft	Gravel, gray, and clay, tan
137-140 ft	Shale, gray, soft

4207 03 7558 17 Altitude 854 ft. Log from records of Kelly Well Drilling Co., driller.

0- 12 ft	Fill
12- 31 ft	Stones and rocks with clay
31- 53 ft	Fine sand
53- 64 ft	Sand, gravel, rocks, stones
64- 99 ft	Sand, stones, rocks, gravel with clay
99-112 ft	Sand, gravel, rocks, stones
112-117 ft	Silt or clay
117-123 ft	Sand and silt
at 123 ft	Bedrock

4207 26 7558 41 Altitude 841 ft. Log from sample study by Ted Arnow, U.S. Geol. Survey. Analyses by field kit.

0-37 ft	Clay, sand, and gravel; brown; drills easily; very sandy at 20 ft, bedded clay layers at 30 ft
37-45 ft	Sand, fine to medium, and gravel; brown; water-bearing. Hardness 156, alkalinity 132, chloride 18 mg/l
45-48 ft	Clay, sand, and gravel, brown
48-53 ft	Gravel and medium to coarse sand, brown, water-bearing. Hardness 152, alkalinity 140, chloride 22 mg/l

Note:

$\underbrace{\text{4207 13}}_{\text{Latitude}}$ $\underbrace{\text{7558 39}}_{\text{Longitude}}$ = Test Boring/Well Location and Numbering System.

Source: USGS, Bulletin 69, 1972.

APPENDIX E.4

GRAIN SIZE DATA

SUMMARY OF TEST RESULTS
USAF JOHNSON CITY
NEW YORK
FRED C HART ASSOCIATES

SEPTEMBER 21, 1986

01071-00-86007-00

E.4-2

ENGINEER V. DeVillez
DATE ASSIGNED 9-13
DATE DUE ASAP

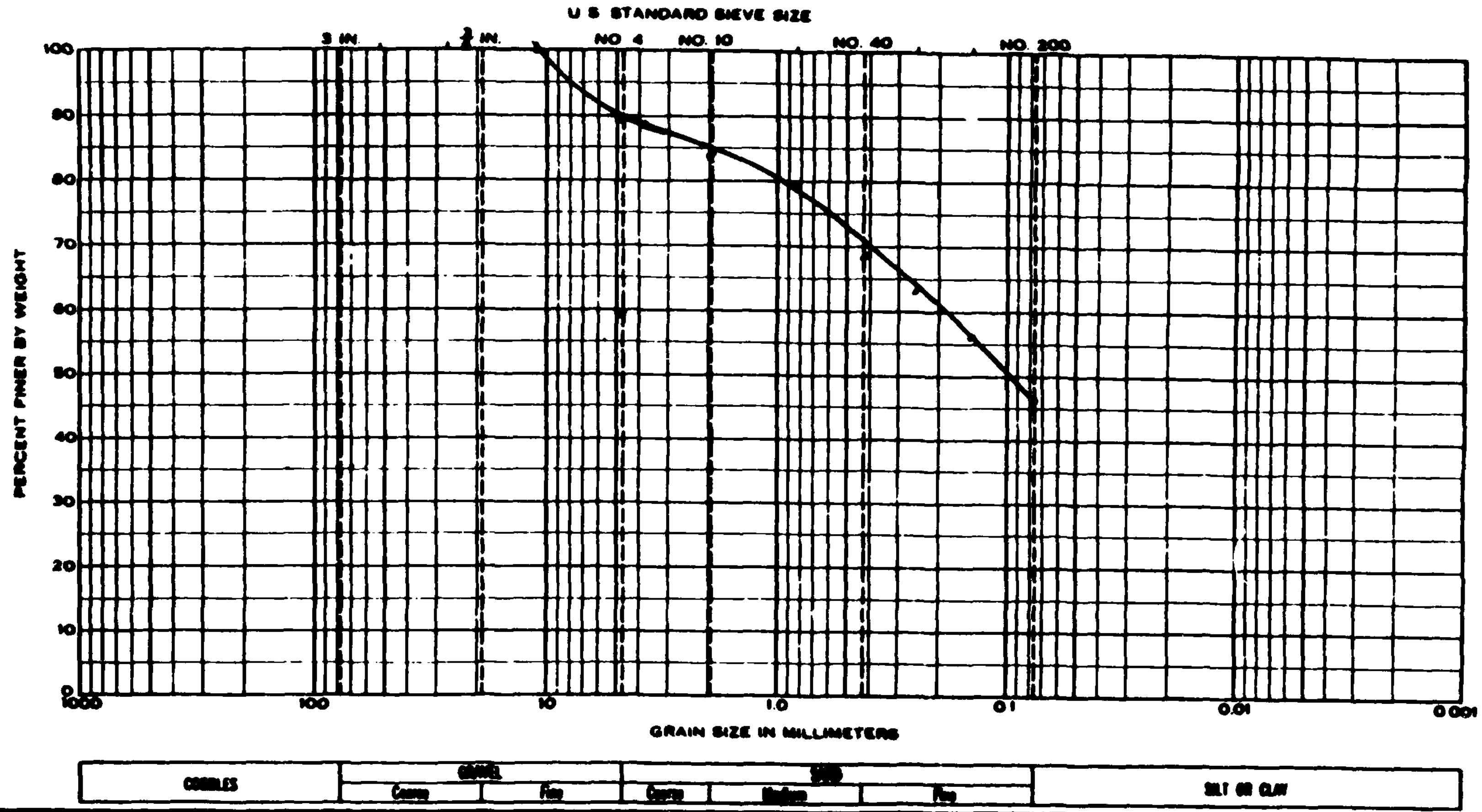
JOB No. 86B119-01
JOB NAME 01071-00-86007-00
HART
USAF Johnson City, NY

DATE REC. 9-17-86
DATE CMP. 9-21-86
REC. BY ~B
Page No. 1

SUMMARY OF LABORATORY TEST RESULTS

BORING and SAMPLE No	DEPTH - feet	CLASSIFICATION	PERM k cm/sec	NATURAL WATER CONTENT (%)	ATTERBERG LIMITS		UNCON. COMPRESS.		UNIT DRY WGT (pcf)	SPECIFIC GRAVITY	GRAIN SIZE		OPT MOIST	CONSOLID.	TRIAXIAL			
					LIQUID LIMIT	PLASTIC LIMIT	STRESS (tsf)	STRAIN (%)			SIEVE	HYDR			UU	$\overline{CIU}$	CELL PRESSURE (psi)	BACK PRESSURE (psi)
SW-1 SS-3	10'-12'										✓ *							
SW-1 SS-12	28'-30'										✓ *							
SW-2 SS-4	12'-14'										✓ *							
SW-2 SS-9	22'-24'										✓ *							
SW-3 SS-2	5'-7'										✓ *							
SW-3 SS-12	28-30'										✓ *							

* See Test Curves ✓ TEST COMP and CHECKED ● TEST IN PROGRESS

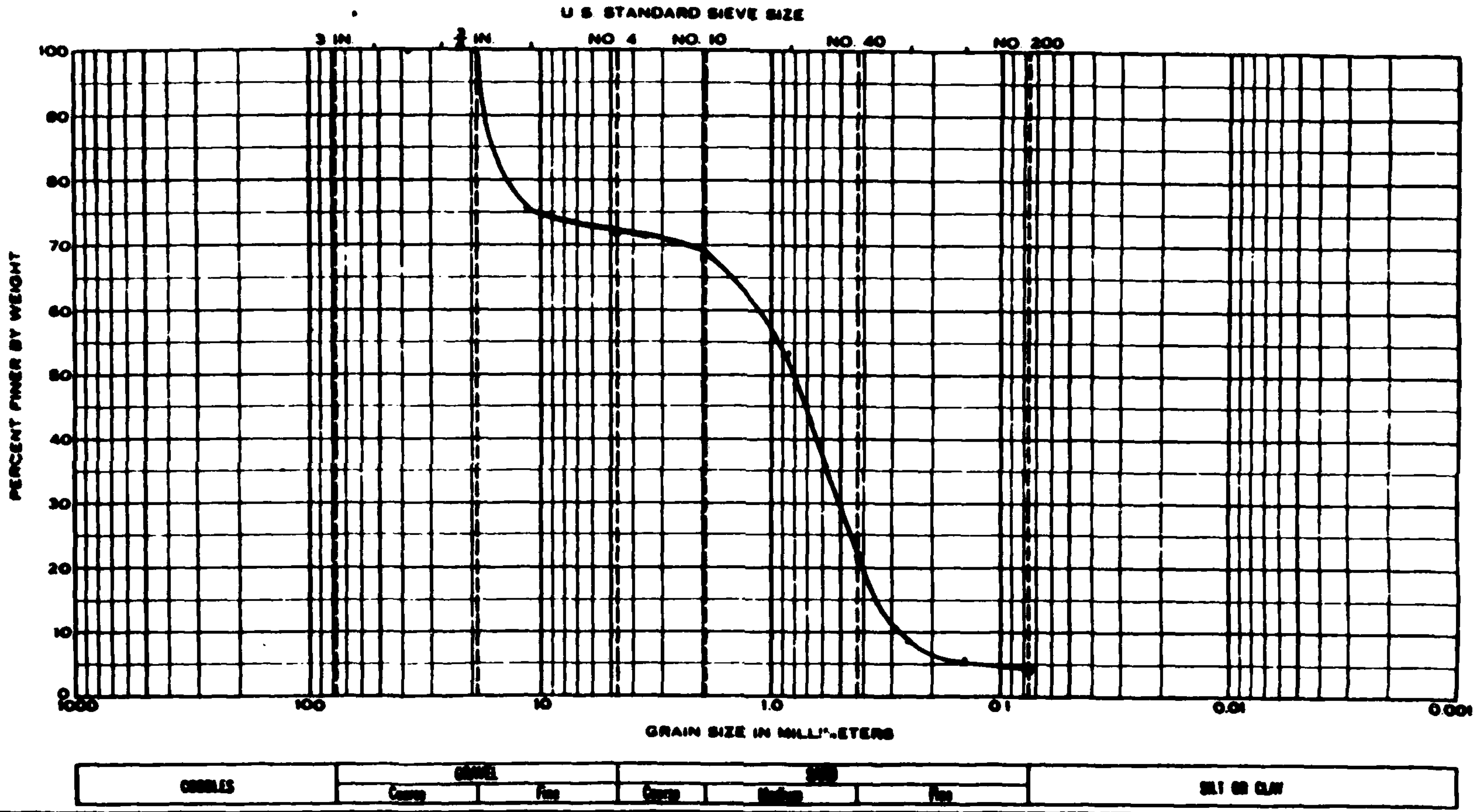


Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI
SW-1 SS-3	10'-12'	C-F Silty SAND w/ some f gravel				

Project	HART
	USAF
	Johnson City NY
Date	9-20-86 JOB No. 86B1 7-01

GRADATION CURVES

J & L TESTING COMPANY

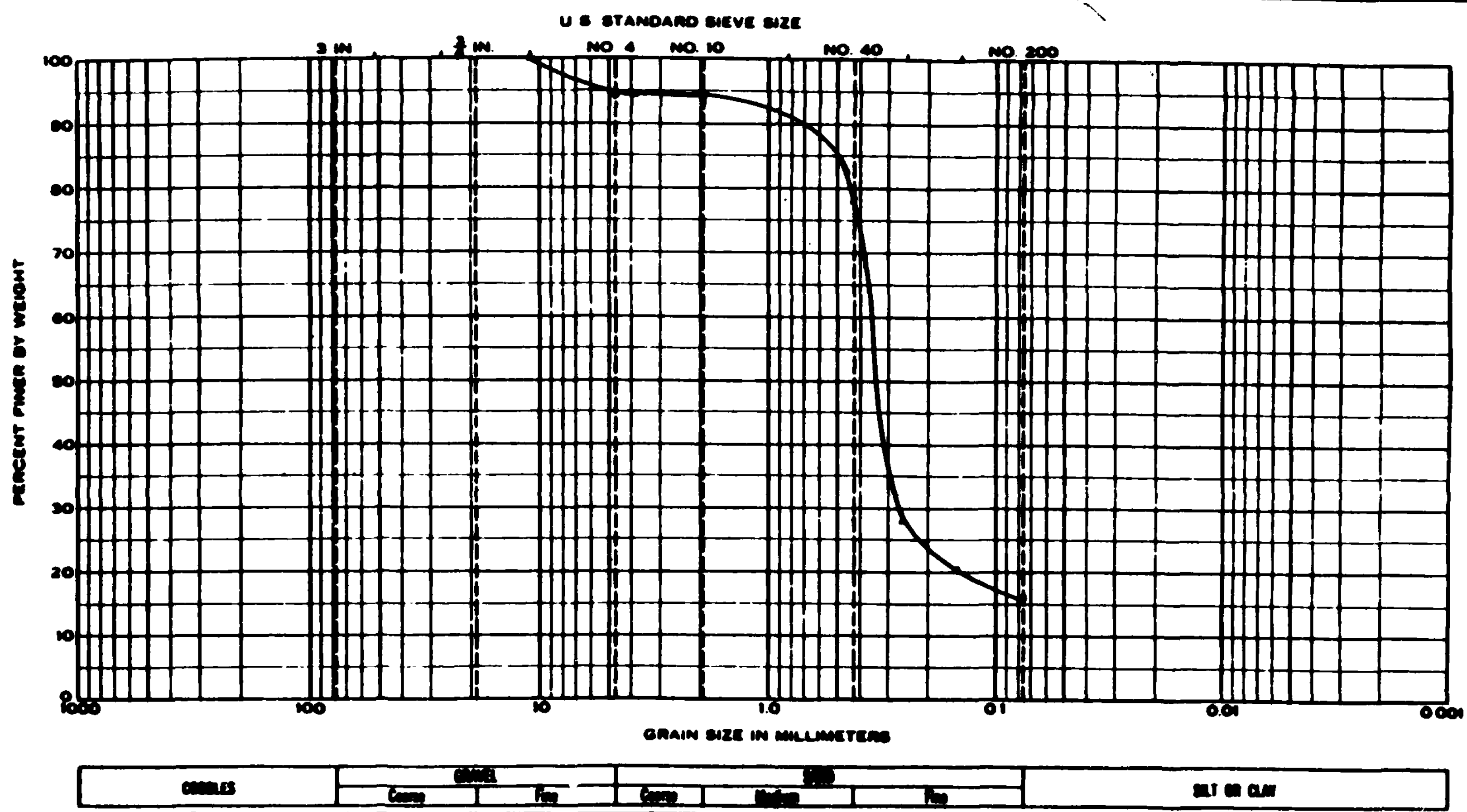


Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI	
SW-1 SS-12	28'-30'	C-F SAND w/ some Gravel & tr silt					

Project	HART
	USAF
	Johnson City, NY
Date	9-20-86 JOB No. 86B117-01

GRADATION CURVES

J & L TESTING COMPANY



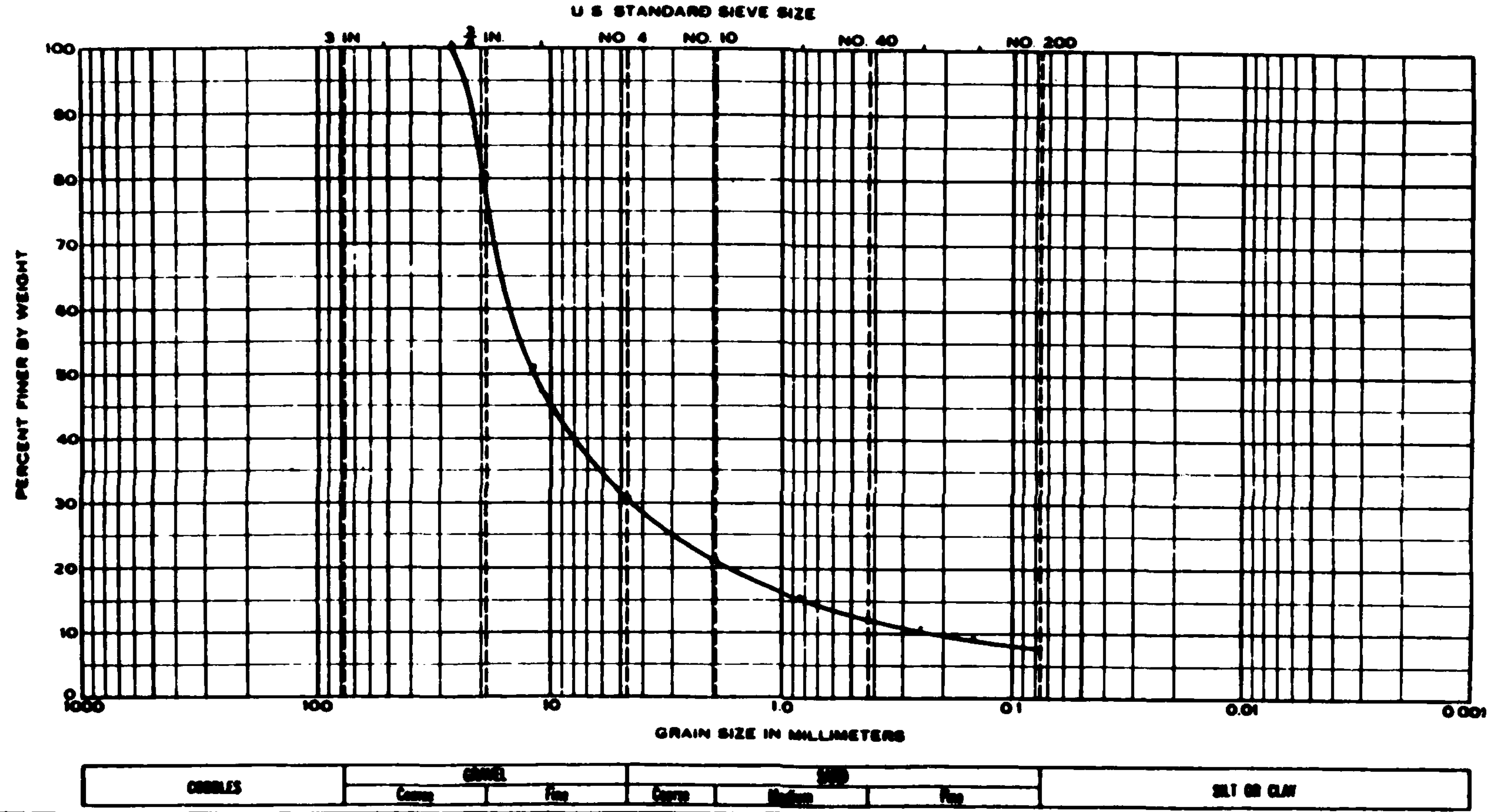
Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI
SW-2 SS-4	12'-14'	M-F Silty SAND				

Project HART
USAF
Johnson City, NY

Date 9-20-86 JOB No. 86B1-4-01

GRADATION CURVES

J & L TESTING COMPANY



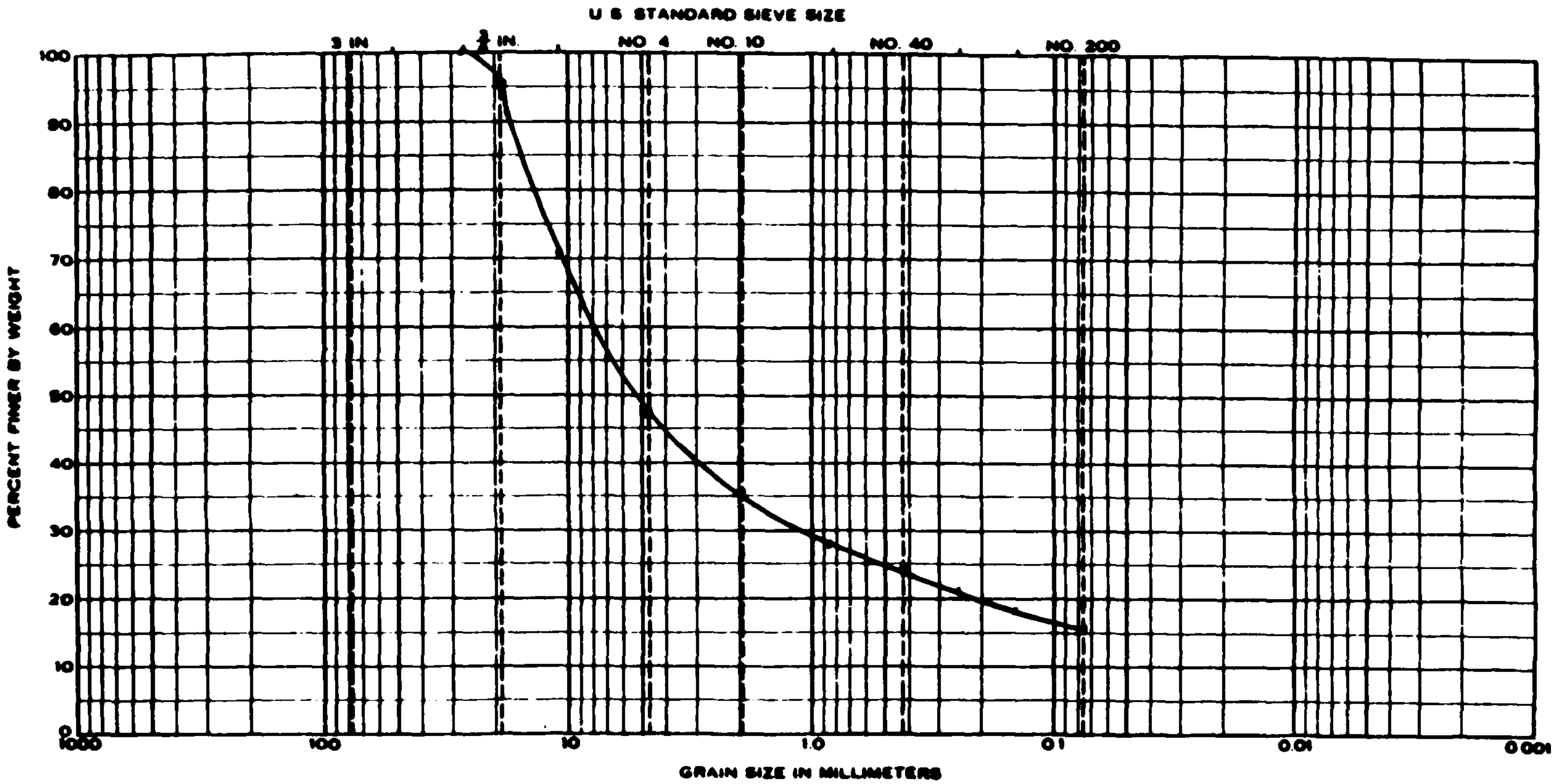
Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI
SW-2 SS-9	22'-24'	F GRAVEL w/ C-F Sand & some silt				

Project HART
USAF
Johnson City, NY

Date 9-20-80 JOB No. 86819-01

GRADATION CURVES

J & L TESTING COMPANY



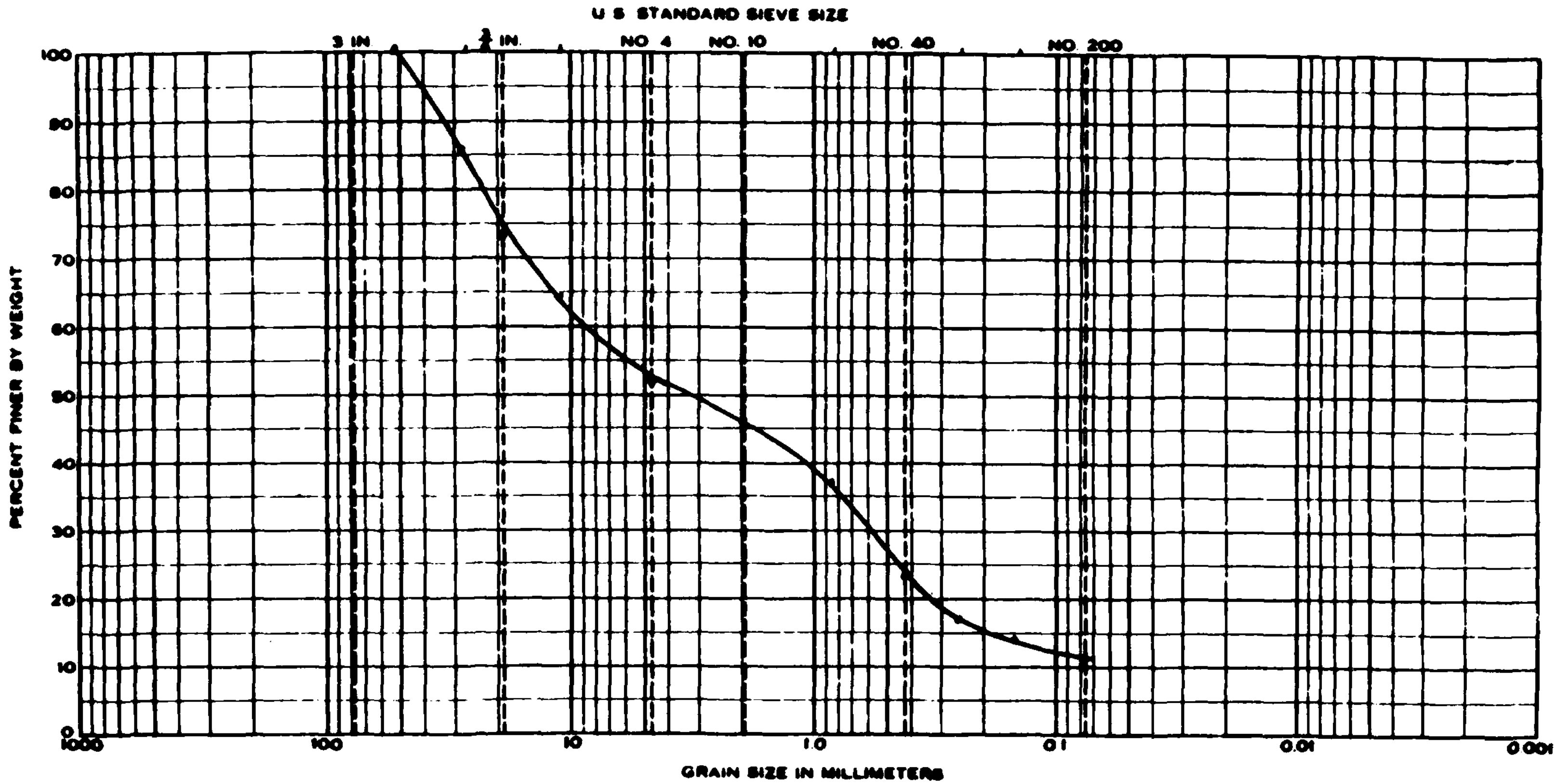
COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI
SW-3	5'-7'	F-GRAVEL & C-F				
SS-2		silty Sand				

Project	HART
	USAF
	Johnson City NY
Date	9-20-86 JOB No. 86B119.01

GRADATION CURVES

J & L TESTING COMPANY



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI	
SW-3	28'-30'	C-F Sandy F GRAVEL					
SS-12		w/ some Silt					

Project	HART
	USAF
	Johnson City, NY
Date 9-20-86	JOB No. 86B119-01

GRADATION CURVES

J & L TESTING COMPANY

APPENDIX A
RAW DATA

GRAIN SIZE ANALYSIS

PROJECT NAME HART — JOB NO. 86B119-01

PROJECT LOCATION USAF JOHNSON CITY

BORING NO. BW-1 — SAMPLE NO. SS-3

DEPTH 10-12 — MAT. DESCRIPTION APP-59

DATE 9-21-86 — BY JB

SIEVE SIZE	WT.GMS	PERCENT PASSING
3 INCH	.00	100.000
2 INCH	.00	100.000
1 INCH	.00	100.000
.75 INCH	.00	100.000
.50 INCH	.00	100.000
NO. 4	15.30	93.914
NO. 10	7.30	84.772
NO. 20	7.40	79.894
NO. 40	17.30	68.688
NO. 60	7.20	63.546
NO. 100	11.30	56.097
NO. 200	14.60	46.473

GRAIN SIZE ANALYSIS-MECHANICAL

Project HART Job No. 86B119-01

Location of Project USAF Boring No. SW-1 Sample No. 3

Description of Soil AFP-59 Depth of Sample 10-12

Tested By DIG Date of testing 9-18

Total wt in grams of sample, W_s = 151.7			Wt in grams of material > No. 4 sieve =			
Sieve Openings		U. S. Standard Sieve Size or Number	Weight Retained in grams	Percent Retained		Percent Finer by Weight
Inches	Millimeters			Partial	Total	
3.00		3-in.				
2.00		2-in.				
1.50		1-1/2-in.				
1.00	25.4	1-in.				
0.750	19.1	3/4-in.				
0.500	12.7	1/2-in.				
0.375	9.52	3/8-in.				
0.187	4.76	No. 4	15.3			
		Pan				
0.079	2.00	No. 10	7.8			
0.033	0.84	No. 20	7.4			
0.0165	0.42	No. 40	17.0			
	0.25	No. 60	7.3			
0.0059	0.149	No. 100	11.3			
0.0029	0.074	No. 200	14.6			
		Pan				
Total weight in grams						

Soil Sample Size (ASTM D1140-54)

Nominal diameter of largest particle	Approximate minimum Wt. of sample, g
No. 10 sieve	200
No. 4 sieve	500
3/4 in.	1500

Remarks

Technician ______ Computed by ______ Checked by ______

Wt. of dry sample + container	190.0
Wt. of container	38.3
Wt. of dry sample, W,	

J & L TESTING COMPA[NY]
Geotechnical Test[ing]

GRAIN SIZE ANALYSIS

PROJECT NAME HART JOB NO. 86B119-21

PROJECT LOCATION USAF JOHNSON CITY

BORING NO. MW-1 SAMPLE NO. SS-12

DEPTH 28-30 MAT. DESCRIPTION 2 JARS

DATE 9-21-86 BY JB

SIEVE SIZE	WT.GMS	PERCENT PASSING
3 INCH	.00	100.000
2 INCH	.00	100.000
1 INCH	.00	100.000
.75 INCH	.00	100.000
.50 INCH	60.20	76.575
NO. 4	11.10	72.256
NO. 10	9.40	68.599
NO. 20	39.70	53.151
NO. 40	81.20	21.284
NO. 60	33.50	8.249
NO. 100	7.70	5.252
NO. 200	2.90	4.124

GRAIN SIZE ANALYSIS-MECHANICAL

Project HART Job No. 868119-01

Location of Project USAF Boring No. SW-1 Sample No. SS-16

Description of Soil (2Jar) Depth of Sample 28-30

Tested By DSB Date of testing 7/19

Total wt in grams of sample, W_s = 257.0 | Wt in grams of material > No. 4 sieve =

Sieve Openings Inches	Sieve Openings Millimeters	U. S. Standard Sieve Size or Number	Weight Retained in grams	Percent Retained Partial	Percent Retained Total	Percent Finer by Weight
3.00		3-in.				
2.00		2-in.				
1.50		1-1/2-in.				
1.00	25.4	1-in.				
0.750	19.1	3/4-in.				
0.500	12.7	1/2-in.	60.2			
0.375	9.52	3/8-in.				
0.187	4.76	No. 4	11.1			
		Pan				
0.079	2.00	No. 10	9.4			
0.033	0.84	No. 20	39.7			
0.0165	0.42	No. 40	81.9			
	0.25	No. 60	33.5			
0.0059	0.149	No. 100	7.7			
0.0029	0.074	No. 200	2.9			
		Pan				
		Total weight in grams				

Soil Sample Size **(ASTM D1140-54)**

Nominal diameter of largest particle	Approximate minimum Wt. of sample, g
No. 10 sieve	200
No. 4 sieve	500
3/4 in.	1500

Remarks

Technician ______ Computed by ______ Checked by ______

Wt. of dry sample + container	296.2
Wt. of container	39.2
Wt. of dry sample, W',	

J & L TESTING COMPANY
Geotechnical Testing

GRAIN SIZE ANALYSIS

PROJECT NAME HART JOB NO. 869113-01

PROJECT LOCATION USAF JOHNSON CITY

BORING NO. SW-2 SAMPLE NO. SS-1

DEPTH 12-14 MAT. DESCRIPTION 2 JARS

DATE 9-21-86 BY JB

SIEVE SIZE	WT.GMS	PERCENT PASSING
3 INCH	.00	100.000
2 INCH	.00	100.000
1 INCH	.00	100.000
.75 INCH	.00	100.000
.50 INCH	.00	100.000
NO. 4	9.40	94.774
NO. 10	.40	94.552
NO. 20	.40	94.330
NO. 40	28.20	78.654
NO. 60	91.10	28.015
NO. 100	14.40	20.011
NO. 200	6.70	16.296

GRAIN SIZE ANALYSIS-MECHANICAL

Project HART Job No. 86B119-01

Location of Project USAF Boring No. SW-2 Sample No. SS-4

Description of Soil (2 JAR) Depth of Sample 12'-14

Tested By Date of testing 9-19

DHJ

Total wt in grams of sample, W_s = 179.9				Wt in grams of material > No. 4 sieve =		
Sieve Openings		U. S. Standard Sieve Size or Number	Weight Retained in grams	Percent Retained		Percent Finer by Weight
Inches	Millimeters			Partial	Total	
3.00		3-in.				
2.00		2-in.				
1.50		1-1/2-in.				
1.00	25.4	1-in.				
0.750	19.1	3/4-in.				
0.500	12.7	1/2-in.				
0.375	9.52	3/8-in.				
0.187	4.76	No. 4	9.4			
		Pan				
0.079	2.00	No. 10	0.4			
0.033	0.84	No. 20	0.4			
0.0165	0.42	No. 40	28.2			
	0.25	No. 60	91.1			
0.0059	0.149	No. 100	14.4			
0.0029	0.074	No. 200	6.7			
		Pan				
Total weight in grams						

Soil Sample Size (ASTM D1140-54)

Nominal diameter of largest particle	Approximate minimum Wt. of sample, g
No. 10 sieve	200
No. 4 sieve	500
3/4 in.	1500

Remarks

Technician_____ Computed by_____ Checked by_____

Wt. of dry sample + container	218.4
Wt. of container	38.5
Wt. of dry sample, W',	

J & L TESTING COMPANY

Geotechnical Testing

GRAIN SIZE ANALYSIS

PROJECT NAME HART JOB NO. 855113-01

PROJECT LOCATION USAF JOHNSON CITY

BORING NO. SW-2 SAMPLE NO. SS-2

DEPTH 12-14 MAT. DESCRIPTION 1 JAR

DATE 9-11-86 BY JB

SIEVE SIZE	WT. GMS	PERCENT PASSING
3 INCH	.00	100.000
2 INCH	.00	100.000
1 INCH	.00	100.000
.75 INCH	35.90	80.720
.50 INCH	56.60	50.348
NO. 4	34.70	31.723
NO. 10	19.20	21.417
NO. 20	11.80	15.083
NO. 40	5.20	12.292
NO. 60	1.30	11.357
NO. 100	2.00	9.983
NO. 200	2.30	8.749

GRAIN SIZE ANALYSIS-MECHANICAL

Project HART Job No. 86B1-7-31

Location of Project USAF Boring No. SW-2 Sample No. S-9

Description of Soil ______ Depth of Sample 22-24

Tested By 537 Date of testing 91-8

Total wt in grams of sample, W_s = 186.3 | Wt in grams of material > No. 4 sieve =

Sieve Openings Inches	Sieve Openings Millimeters	U. S. Standard Sieve Size or Number	Weight Retained in grams	Percent Retained Partial	Percent Retained Total	Percent Finer by Weight
3.00		3-in.				
2.00		2-in.				
1.50		1-1/2-in.				
1.00	25.4	1-in.				
0.750	19.1	3/4-in.	35.9			
0.500	12.7	1/2-in.	56.6			
0.375	9.52	3/8-in.				
0.187	4.76	No. 4	34.7			
		Pan				
0.079	2.00	No. 10	19.2			
0.033	0.84	No. 20	11.8			
0.0165	0.42	No. 40	5.2			
	0.25	No. 60	2.3			
0.0059	0.149	No. 100	2.0			
0.0029	0.074	No. 200	2.3			
		Pan				
Total weight in grams						

Soil Sample Size (ASTM D1140-54)

Nominal diameter of largest particle	Approximate minimum Wt. of sample, g
No. 10 sieve	200
No. 4 sieve	500
3/4 in.	1500

Remarks

Technician ______ Computed by ______ Checked by ______

Wt. of dry sample + container	225.1
Wt. of container	38.8
Wt. of dry sample, W'ₛ	

J & L TESTING COMPANY
Geotechnical Testing

GRAIN SIZE ANALYSIS

PROJECT NAME HART — JOB NO. 86B113-01

PROJECT LOCATION USAF JOHNSON CITY

BORING NO. SW-3 — SAMPLE NO. SS-2

DEPTH 5-7 — MAT. DESCRIPTION 1 JAR

DATE 9-21-86 — BY JB

SIEVE SIZE	WT.GMS	PERCENT PASSING
3 INCH	.00	100.000
2 INCH	.00	100.000
1 INCH	.00	100.000
.75 INCH	12.10	95.252
.50 INCH	60.70	71.495
NO. 4	62.00	47.220
NO. 10	29.70	35.591
NO. 20	19.10	28.112
NO. 40	10.20	24.119
NO. 60	7.00	21.379
NO. 100	7.10	18.598
NO. 200	8.30	15.348

E.4-19

GRAIN SIZE ANALYSIS-MECHANICAL

Project HART Job No. 86B119-01

Location of Project L-AF Boring No. SW-3 Sample No. SS-2

Description of Soil ______ Depth of Sample 5'-7'

Tested By D70 Date of testing 9/19

Total wt in grams of sample, W_s = 2554 | Wt in grams of material > No. 4 sieve =

Sieve Openings Inches	Sieve Openings Millimeters	U. S. Standard Sieve Size or Number	Weight Retained in grams	Percent Retained Partial	Percent Retained Total	Percent Finer by Weight
3.00		3-in.				
2.00		2-in.				
1.50		1-1/2-in.				
1.00	25.4	1-in.				
0.750	19.1	3/4-in.	12.1			
0.500	12.7	1/2-in.	60.7			
0.375	9.52	3/8-in.				
0.187	4.76	No. 4	62.0			
		Pan				
0.079	2.00	No. 10	29.7			
0.033	0.84	No. 20	19.1			
0.0165	0.42	No. 40	10.2			
	0.25	No. 60	7.0			
0.0059	0.149	No. 100	7.1			
0.0029	0.074	No. 200	8.3			
		Pan				
Total weight in grams						

Soil Sample Size (ASTM D1140-54)

Nominal diameter of largest particle	Approximate minimum Wt. of sample, g
No. 10 sieve	200
No. 4 sieve	500
3/4 in.	1500

Remarks

Technician ______ Computed by ______ Checked by ______

Wt. of dry sample + container	2935
Wt. of container	38.1
Wt. of dry sample, W,	

J & L TESTING COMPANY
Geotechnical Testing

GRAIN SIZE ANALYSIS

PROJECT NAME HART JOB NO. 86B119-01

PROJECT LOCATION USAF JOHNSON CITY

BORING NO. SW-3 SAMPLE NO. SS-12

DEPTH 28-30 MAT. DESCRIPTION 2 JARS

DATE 9-21-86 BY JB

SIEVE SIZE	WT.GMS	PERCENT PASSING
3 INCH	.00	100.000
2 INCH	.00	100.000
1 INCH	79.80	86.682
.75 INCH	80.00	73.162
.50 INCH	49.00	64.880
NO. 4	72.20	52.678
NO. 10	36.30	46.543
NO. 20	54.70	37.299
NO. 40	84.50	23.018
NO. 60	31.50	17.694
NO. 100	18.90	14.500
NO. 200	14.90	11.982

GRAIN SIZE ANALYSIS-MECHANICAL

Project HART Job No. 86 B119-01

Location of Project UAF Boring No. SW-3 Sample No. SS-12

Description of Soil (2Jan) Depth of Sample 28-30'

Tested By Date of testing 9/9

D17-32L

Total wt in grams of sample, W_s = 591.7				Wt in grams of material > No. 4 sieve =		
Sieve Openings		U. S. Standard Sieve Size or Number	Weight Retained in grams	Percent Retained		Percent Finer by Weight
Inches	Millimeters			Partial	Total	
3.00		3-in.				
2.00		2-in.				
1.50		1-1/2-in.				
1.00	25.4	1-in.	78.8			
0.750	19.1	3/4-in.	80.0			
0.500	12.7	1/2-in.	49.0			
0.375	9.52	3/8-in.				
0.187	4.76	No. 4	72.2			
		Pan				
0.079	2.00	No. 10	36.3			
0.033	0.84	No. 20	54.7			
0.0165	0.42	No. 40	84.5			
	0.25	No. 60	31.5			
0.0059	0.149	No. 100	18.9			
0.0029	0.074	No. 200	14.9			
		Pan				
Total weight in grams						

Soil Sample Size (ASTM D1140-54)

Nominal diameter of largest particle	Approximate minimum Wt. of sample, g
No. 10 sieve	200
No. 4 sieve	500
3/4 in.	1500

Remarks

Technician______ Computed by______ Checked by______

	D17	D32
Wt. of dry sample + container	333.0	336.4
Wt. of container	39.0	38.7
Wt. of dry sample, W,	294.0	297.7

J & L TESTING COMPANY
Geotechnical Testing

APPENDIX B

CHAIN OF CUSTODY FORM

FRED C. HART ASSOCIATES, INC.
530 FIFTH AVENUE
NEW YORK, N.Y. 10036

CHAIN OF CUSTODY

JACK Borchuck

ML Sample No.: ______

Client Name: USAF-Johnson City, NY Client No.: 0071-00-86007-00

Sample Name: SW-1, SS-3, 10-12' / " 11-12, 28-30' Date/Time Sampled: ______

Sample Location: SW-2, 11-1, 12-14, / " 11-9, 22-24' / SW-7, 11-2, 5-7' / SW-3, 11-12, 28-30'

No. of Sample Bottles: 9 Preservatives: ___ General Chem: 4° C
___ Oil & Grease: HCl
___ Metals : HNO_3
___ ______ : ___

Temperature: ______

Sampled by: V. DeVillez

Sampling Devices used: Split Spoon

Potential Contamination/Interference: ______

Sample History or Special Notes: ______

Date Received by Lab: ______ By: ______

Transmitted to Lab by: ______
name title

Phone: ______

Relinquished by: V. DeVillez Date: 9/12/86

Relinquished by: J Borchuck J&L Testing (in Storage) Date: 9/17/86

Relinquished by: ______ Date: ______

Relinquished by: ______ Date: ______

Relinquished by: ______ Date: ______

Final Disposition of samples: ______

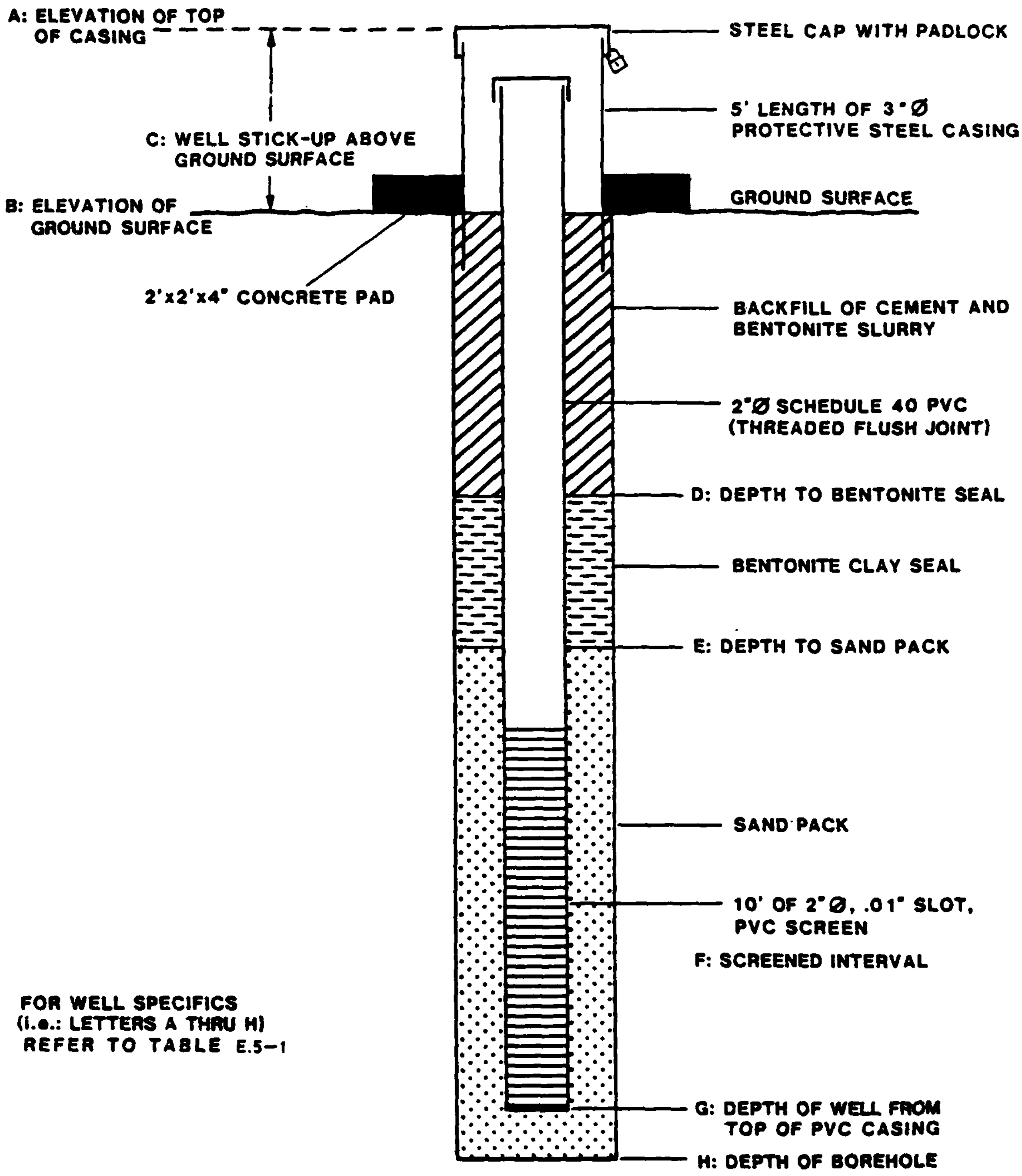
Date: ______ Location: ______

Instructions: Please fill this form out as completely as possible. When the form is received by the Laboratory request a copy for your file. The abbreviated form for Chain of Custody is used simultaneously as the Analysis Request Form for the above sample or sample group.

APPENDIX E.5

SUMMARY OF WELL CONSTRUCTION

(CL5119A)
(01071-00-86007-00)



FOR WELL SPECIFICS
(i.e.: LETTERS A THRU H)
REFER TO TABLE E.5-1

NOT TO SCALE

FIGURE E.5-1

SCHEMATIC
WELL CONSTRUCTION DIAGRAM

FRED C. HART ASSOCIATES, INC.

Table E.5-1

WELL CONSTRUCTION DATA

Well #	A Elev. TOC Ft (MSL)	B Elev. Ground Surface Ft (MSL)	C Stick-Up Ft	D Depth To Bentonite Seal Ft	E Depth To Sand Pack Ft	F Screened Interval Ft	G Depth Of Well From TOC Ft	H Depth Of Borehole Ft
SW-1	834.83	831.90	2.93	13	15	17-27	29.93	27
SW-2	831.09	828.90	2.19	12	14	16-26	28.19	26
SW-3	831.21	829.40	1.81	15	17	19-29	30.81	29

NOTE: The values in columns C,D,E,F and H are measurements taken during well construction relative to the ground surface.

APPENDIX F

SAMPLING AND ANALYTICAL PROCEDURES

(CL5121A)

APPENDIX F.1

FIELD SAMPLING METHODS

(CL5119A)
(01071-00-86007-00)

FIELD ANALYTICAL PROCEDURES AND DATA REPORTING

Chemical Data

- Procedures for Field Measurement of pH. Readings were taken periodically in buffer solutions of the appropriate range at the same temperature during repeated sampling events. The users manual for the pH meter was available to field personnel.

- Procedures for Field Measurement of Electrical Conductivity. When rapid sample changes did not occur, replicate measurements were made. A standard solution of known conductivity was made available for checking precision. Several readings were taken and the arithmetic mean used as the reported value. The users manual for the electrical conductivity meter was available to field personnel.

- Procedures for Field Measurement of Volatile Organics. Approximately 20 ml of soil was placed in VOA vials. The vials were placed in a 40°C hot water bath for ten minutes. An aliquot of air from the headspace within the vial was then withdrawn by syringe for direct injection into the OVA.

Hydraulic Data

- Procedures for Measurements. An M-scope was used to measure to 0.01 foot the water level under static conditions.

Soil Boring Data

- Soil Sampling. Continuous split spoon samples were collected at each test boring site. Sample depth was monitored by the subcontractor (driller) under the supervision of the on-site hydrogeologist.

- Blow Counts. Soil density was determined by recording the number of blows necessary for the split spoon to penetrate six inches of soil.

SAMPLE NUMBERING SYSTEM

A sample numbering system was used to identify each sample taken during the on-site remedial investigation. The numbering system provides a tracking procedure to allow retrieval of information about a particular site and assure that each sample is uniquely numbered. A listing of sample numbers was maintained by the HART field team leader. Each sample number consisted of four parts as described below.

Project Identification

The designation AFP 59 was used to identify the Air Force Plant 59, now known as General Electric electro-mechanical systems production facility.

Site Identification

Each sampling site was identified by a two-letter identifier code, with the following prefix:

SW - Shallow well
SB - Soil boring

A numerical suffix unique to each prefix follows.

Sequence Number

A two-letter code was used to identify the type of sample collected such as (groundwater samples were identified as "water"):

SS - Soil sample collected during drilling
WATER - Groundwater sample

Sample Depth

The depth or depth interval at which the sample was collected.

Split Sampling

Two sets of samples were collected. The labels HART, for Fred C. Hart Associates, and USAFOEHL to indicate the sample that was sent to the USAFOEHL laboratory, were used to differentiate the analyzer of each set.

Examples

Examples of sample numbers are:

- AFP 59, SW-1, 18'-20', HART 004. Air Force Plant 59; shallow Monitoring Well #1; soil sample collected between a depth of eighteen and twenty feet below the surface; retained by HART. Fourth soil sample collected from SW-1.

- AFP 59, SW-1, 18'-20', USAFOEHL 004. Same as previous sample; except that it is retained by USAFOEHL.

- AFP 59, SB-1, 8'-10', HART 002. Air Force Plant 59; soil boring #1; soil sample collected at a depth of 8-10 feet; retained by HART. Second soil sample from SB-1 collected.

- AFP 59, SW-1, WATER, HART 001. Air Force Plant 59; Shallow Monitoring Well; first groundwater sample collected; retained by HART.

Blanks, Knowns, Spikes, Splits and Duplicates

QA/QC blank and duplicate samples, sent to the USAFOEHL laboratory and the HART subcontractor, Princeton Testing Laboratories at Princeton, NJ, were given sample numbers similar to those for collected samples. The

identity of QA/QC duplicate samples was recorded in field log books, but was not marked in any way on the sample containers.

USAFOEHL Samples

Samples sent to the USAFOEHL laboratory were accompanied by the following information:

1. Purpose of sample (analyte).
2 Installation name (base).
3. Sample number (on container).
4. Source/location of sample.
5. Contract task number and title of project.
6. Method of collection (bailer, suction pump, air-lift pump, etc.).
7. Volumes removed before sample taken.
8. Special conditions (use of surrogates, filtering, etc.).
9. Preservatives used, especially nonstandard types.

Soil Sampling

Soil samples were collected during drilling with split spoon drive samplers of two-inch outside diameter. Decontamination procedures for sampling equipment are described in Chapter III. Samples were taken continuously (i.e., from two-foot intervals the length of the boring) using a two-foot long split spoon sampler. All soil samples were logged in general accordance with "Description of Soils (Visual Manual Procedure)", ASTM D2488-69, which is based on the Unified Soil Classification System.

A portion of the soil sample from the least disturbed center of the split spoon was placed in a VOA vial for on-site OVA analysis. The remaining portion of the soil sample was placcd in a properly labeled glass jar. The VOA vials were analyzed in the field for the presence of volatile organic compounds and the results recorded. Based on the results, soil samples were selected for submittal to the laboratories for further analysis. Up to two (2) samples per borehole were selected.

These consisted of one soil sample from the water table interface and one additional sample from the unsaturated zone. Also, two samples per borehole were obtained for grain size analysis.

GROUNDWATER MONITORING AND SAMPLING

A total of four wells were sampled. This includes the three wells installed for this study and the existing production well. All measuring, purging and sampling equipment was decontaminated prior to data collection.

Groundwater Level Measurements

After all well installation was completed, the groundwater levels of all the wells were measured within a 24-hour period. The instrument (M-scope: Slope Indicator Co., Model 51453) was lowered down the well and the depth to water was measured from the top of the steel casing. When the electrode of the M-scope came into contact with water, an audio signal was emitted. The instrument was also used to sound the bottom of the well. HART trained GE personnel to take additional groundwater levels in the monitor wells that were installed during this investigation. Groundwater levels must be periodically monitored in order to determine groundwater flow directions over time. It is not cost-effective for HART personnel to travel to the site for the limited time period required to take these measurements. GE personnel were trained to perform monthly groundwater level measurements in the wells.

On-Site Analysis

Monitor Well Sampling. In order for valid representative groundwater samples to be collected from the monitor wells, it was very important to properly prepare the well prior to sample collection. This preparation entailed removing all the water which was standing in the casing and grabbing the sample from water which had recently been recharged from the aquifer.

To accomplish this, the depth to water from the top of the steel well casing was measured. This value was used in conjunction with the total casing length to determine the height of the water column. The volume of water standing in the well was then calculated. At least five times this volume was removed by pumping or bailing before the sample was collected.

Once the well was adequately evacuated, sample collection was then accomplished by lowering a stainless steel, bottom loading bailer with a teflon check valve into the well. Each bailer was fitted with a stainless steel wire leader and a new piece of nylon cord. A different pre-cleaned bailer was devoted to each well. If the bailer had not been used for well evacuation, the first three bails of water were wasted to rinse off any cleaning agents which might still have been present on the bailer. The samples were poured directly from the bailers to sample jars for temperature, pH and specific conductance.

<u>Temperature</u>. Measurements of the sample temperature were taken using a decontaminated mercury thermometer. The field measurement represents the temperature of the aquifer unit at a particular location and time. Variations in sample temperature enabled interpretation of a temperature gradient which reflects aquifer hydraulics. This measurement was also used to calibrate the pH and conductivity meters in the field.

<u>pH</u>. The pH of each sample was measured with a Corning Model 3 pH Meter. Field measurements of sample pH were used as a relative check of the lab measurements. The pH of a sample tends to change upon contact with air, and stabilizes once the sample becomes fully aerated. Therefore, the pH measurements of aerated samples were used as relative indicators of groundwater contamination.

<u>Specific Conductivity</u>. The specific conductivity of each sample was measured with a Markson Model 800-525-5114 Conductivity Meter. Elevated specific conductivities may indicate the presence of conductive ions such as chlorides and sulfides in the groundwater. High concentrations of these ions may indicate contamination.

Sampling Details

Prior to sampling for lab analysis, all wells were properly flushed as described above. Bailers were used to obtain groundwater samples. Bailers were decontaminated between wells. Samples were filtered in the field for metals analysis. All samples were preserved according to the details provided in Table 1. Samples were placed in properly prepared bottles and placed in a cooler at 4°C. Coolers were sealed and shipped overnight to the designated laboratory. One sample was split and was shipped to the USAFOEHL and the other was sent to Princeton Testing Labs. Proper chain-of-custody procedures were followed when transferring the samples from the field to the laboratory. In addition, accurate records were kept of all sampling activity and include the following information: date, time, location, sample number, depth to water measurement, method and volume of water evacuation and sampling techniques.

A total of five samples (including one duplicate) were analyzed for volatile organics, total petroleum hydrocarbons, primary metals and cyanide. This includes the wells installed during this investigation and the existing production well.

Detailed Investigations of Individual Storage Sites

Hazardous Waste Storage Area No. 1 and the Plant Site Investigation. This investigation entailed the installation and continuous sampling of three well borings (SW-1, SW-2 and SW-3) (Figure 1). Based on OVA readings, HART selected up to two soil samples per boring for volatile organic, total petroleum hydrocarbon, primary metals and cyanide analyses. One sample was split. One sample was shipped to the HART-designated laboratory and one to the UASFOEHL. Also, two samples per boring were analyzed for grain size distribution. Three two-inch diameter PVC monitor wells (SW-1, SW-2 and SW-3) were installed. Drill cuttings were immediately drummed upon removal from the borehole and analyzed with the OVA as to their hazardousness. In addition, all seven samples from these three boreholes indicated results below EP Toxicity maximum

TABLE 1

SAMPLE CONTAINERS AND PRESERVATION

Parameter	Volume Required	Container	Preservative	Holding Time
Total Petroleum Hydrocarbons	1 liter	glass	H_2SO_4 to pH <2	28 Days
Primary Metals	1 liter	HDPE	Filter on-site HNO_3 to pH <2	6 months
Volatile Organics	2 bottles	VOA vials	2-3 crystals $Na_2S_2O_3$	14 days
Cyanide	500 ml	glass	NaOH to pH >12	14 days

(CL5119A/1)

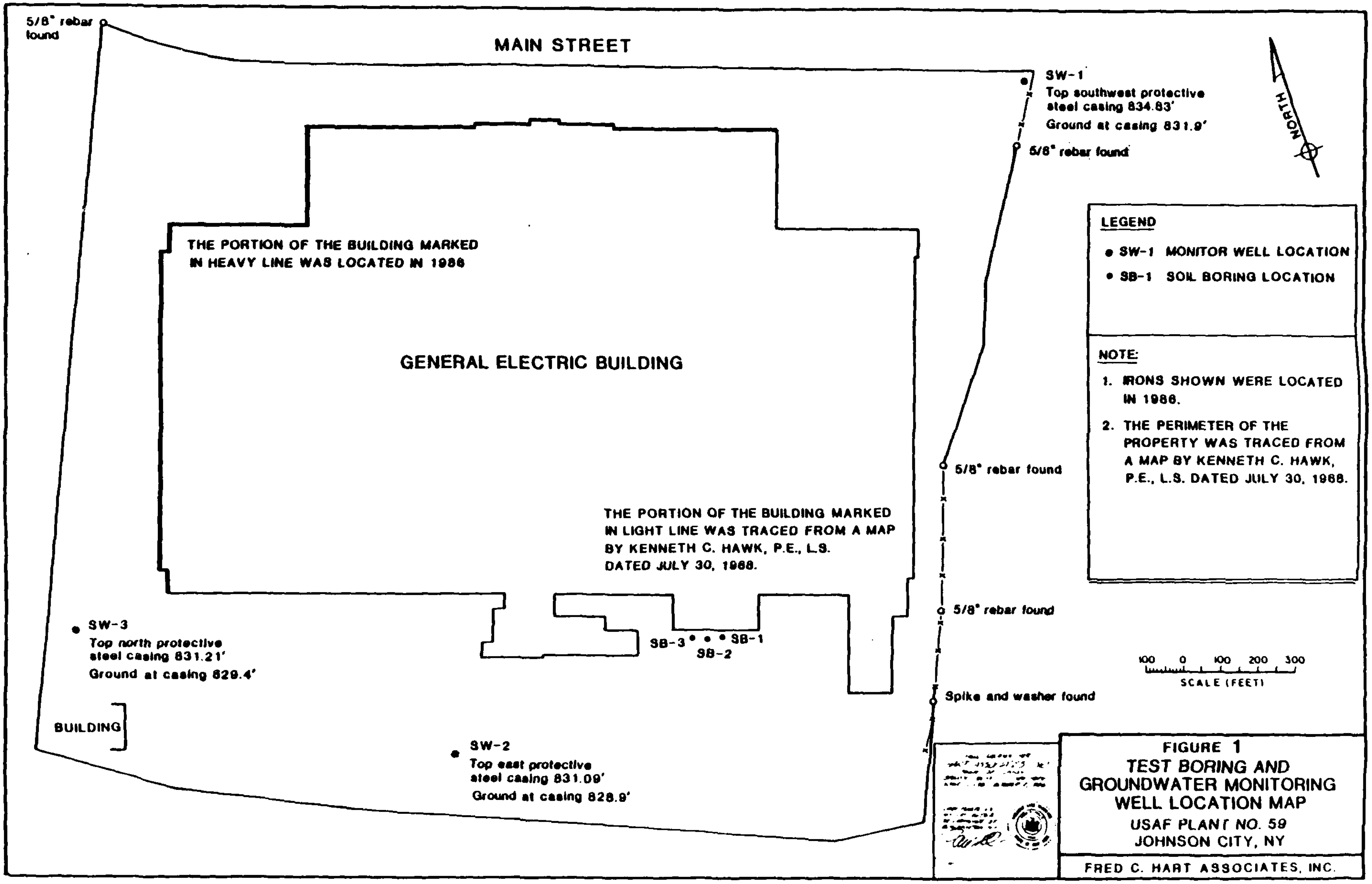


FIGURE 1
TEST BORING AND GROUNDWATER MONITORING WELL LOCATION MAP
USAF PLANT NO. 59
JOHNSON CITY, NY
FRED C. HART ASSOCIATES, INC.

contaminant levels. This information was used by GE to determine disposal requirements. Four water samples (includes one duplicate sample) were collected from the three wells installed during this study and one sample was also collected from the existing production well.

Area No. 2 Investigation. This investigation entailed the installation and continuous sampling of three ten-foot test borings (Figure 1). HART selected six soil samples for EP Toxicity Metals and total chromium analysis. Samples were shipped to the HART-designated laboratory.

In addition to the borehole samples, one soil sample from well boring SW-1 was submitted as a background sample and one sample taken underneath the plating building floor was submitted for analysis.

APPENDIX F.2

LABORATORY DETECTION LIMITS (PTL)

TABLE F.2-1

METHOD DETECTION LIMITS
METALS AND MISCELLANEOUS COMPOUNDS

MATRIX	ANALYTICAL METHOD	SOIL METHOD DETECTION LIMIT mg/L	WATER METHOD DETECTION LIMIT mg/L
Arsenic	E206.2	0.01	0.005
Barium	E200.7	0.05	0.01
Cadmium	E200.7	0.01	0.005
Chromium	E200.7	0.02	0.02
Lead	E200.7	0.02	0.02
Mercury	E245.1	0.001	0.001
Selenium	E270.2	0.01	0.005
Silver	E200.7	0.01	0.01
Total Chromium	E200.7	1.0 (mg/kg)	NA
Cyanide	A412D/SW9010	0.35 (mg/kg)	0.01
Petroleum Hydrocarbons	E418.1	10.0 (mg/kg)	0.5

NA Not Analyzed

(CL5120A)

TABLE F.2-2

METHOD DETECTION LIMITS
VOLATILE ORGANIC COMPOUNDS

MATRIX	ANALYTICAL METHOD	SOIL METHOD DETECTION LIMIT mg/L	WATER METHOD DETECTION LIMIT mg/L
Chloromethane	EPA 601	800	20
Bromethane	EPA 601	400	10
Dichlorodifluoromethane	EPA 601	200	5
Vinyl Chloride	EPA 601	80	1
Chloroethane	EPA 601	80	2
Methylene chloride	EPA 601	200	1
Trichlorofluoromethane	EPA 601	200	5
1,1-dichloroethene	EPA 601	40	1
1,1-dichloroethane	EPA 601	40	1
trans-1,2-dichloroethene	EPA 601	40	1
Chloroform	EPA 601	40	2
1,2-dichloroethane	EPA 601	40	1
1,1,1-trichloroethane	EPA 601	80	2
Carbon Tetrachloride	EPA 601	80	2
Bromodichloromethane	EPA 601	80	2
1,2-dichloropropane	EPA 601	40	1
trans-1,3-dichloropropene	EPA 601	200	5
Trichloroethene	EPA 601	80	2
Dibromochloromethane	EPA 601	80	2

(CL5120A)

TABLE F.2-2 (CONTINUED)

METHOD DETECTION LIMITS
VOLATILE ORGANIC COMPOUNDS

MATRIX		SOIL	WATER
	ANALYTICAL METHOD	METHOD DETECTION LIMIT	
		mg/L	mg/L
1,1,2-trichloroethane	EPA 601	200	0.5
cis-1,3-dichloropropene	EPA 601	200	5
2-chloroethylvinylether	EPA 601	200	5
Bromoform	EPA 601	400	10
1,1,2,2-tetrachloroethane	EPA 601	400	0.18
Tetrachloroethene	EPA 601	80	2
Benzene	EPA 602	40	1
Toluene	EPA 602	40	1
Chlorobenzene	EPA 602	40	1
Ethylbenzene	EPA 602	40	1
1,3-dichlorobenzene	EPA 602	40	1
1,2-dichlorobenzene	EPA 602	40	1
1,4-dichlorobenzene	EPA 602	40	1

APPENDIX G

CHAIN OF CUSTODY FORMS

(0472n-26)

Addendum to Chain of Custody Record (G-2)
Soil Samples From Well Borings

Sample Numbers:	AFP 59, SW-1, 18'-20', Hart 004
	AFP 59, SW-1, 24'-26', Hart 007
	AFP 59, SW-2, 22'-24', Hart 009
	AFP 59, SW-2, 24'-26', Hart 010
	AFP 59, SW-3, 22'-24', Hart 009
	AFP 59, SW-3, 24'-26', Hart 010
	AFP 59, SW-4, 22'-24', Hart 001
Analyses Requested:	Total Petroleum Hydrocarbons
	EP Toxicity Metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag)
	Halogenated and Aromatic Volatile Organic Compounds
	Cyanide
Sample Matrix:	Soil
Preservatives:	None
Date Sampled:	9/9/86 - SW-1
	9/10/86 - SW-2, SW-4
	9/11/86 - SW-3
Date Shipped:	9/12/86 via Federal Express
Date Received:	9/15/86 by Princeton Testing Laboratories

(CL5124A/1)

FRED C. HART ASSOCIATES, INC.
530 FIFTH AVENUE
NEW YORK, N.Y. 10036

CHAIN OF CUSTODY

ML Sample No.: ________

Client Name: FCHA Client No.: ________

Sample Name: Soil-from Wellboring Date/Time Sampled: 9/9-9/11/86

Sample Location: Johnson City, NY (GE PLANT)

Sample IDs: SW-1: 24-26'; 18-20'; SW-2: 24-26', 22-24'; SW-3: 22-24'; 24-26'; SW-4: 22-24'

No. of Sample Bottles: 7 Preservatives: ___ General Chem: 4° C
___ Oil & Grease: HCl
Temperature: ________ ___ Metals : HNO_3
✓ none :

Sampled by: V. DeVillez

Sampling Devices used: Split spoon

Potential Contamination/Interference: SW-1 SS-10, 24-26 - Possible cross contamination from ice water in cooler

Sample History or Special Notes: Analyze for: Petroleum Hydrocarbons (SW3550/ Aromatic E418.1); PRIMARY METALS (EP TOXICITY); Halogenated and Volatile Organics (SW5030); Cyanide (SW9010).

Date Received by Lab: ________ By: ________

Transmitted to Lab by: FEDEX
name title

Phone: ________

Relinquished by: V. DeVillez Date: 9/12/86

Relinquished by: ________ Date: ________

Relinquished by: ________ Date: ________

Relinquished by: ________ Date: ________

Relinquished by: ________ Date: ________

Final Disposition of samples: PTL

Date: 9/15/86 Location: Princeton Testing Labs

Instructions: Please fill this form out as completely as possible. When the form is received by the Laboratory request a copy for your file. The abbreviated form for Chain of Custody is used simultaneously as the Analysis Request Form for the above sample or sample group.

Addendum to Change of Custody Record (G-4)
Soil Samples From Test Borings

Sample Numbers:	AFP 59, SB-1, 2'-4', Hart 002 AFP 59, SB-1, 4'-6', Hart 003 AFP 59, SB-2, 0.5'-2', Hart 001 AFP 59, SB-2, 6'-8', Hart 004 AFP 59, SB-3, 2'-4', Hart 001 AFP 59, SB-3, 8'-10', Hart 004 AFP 59, Plating Room East-2, GE 002 AFP 59, SW-1, 20'-22', Hart 005
Analyses Requested:	EP Toxicity Metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag) Total Chromium
Sample Matrix:	Soil
Preservatives:	None
Date Sampled:	9/12/86 - SB Series 9/9/86 - AFP 59, SW-1, 20'-22', Hart 005 9/10/86 - AFP 59, Plating Room East-2, GE 002
Date Shipped:	9/12/86 via Federal Express
Date Received:	9/13/86 by Princeton Testing Laboratories

(CL5124A/1)

FRED C. HART ASSOCIATES, INC.
530 FIFTH AVENUE
NEW YORK, N.Y. 10036

CHAIN OF CUSTODY

ML Sample No.: ______

Client Name: FCHA Client No.: C1071-00-86007-00

Sample Name: Soil Date/Time Sampled: ______

Sample ~~Location~~ ID: SB-1: 2-4', 4-6'. SB-2: 0.5-2', 6-8'.
SB-3: 2-4', 8-10''; SW-1: 20-22'; Pl. Room EAST(

No. of Sample Bottles: ______ Preservatives: ______ General Chem: 4° C
Oil & Grease: HCl
Temperature: ______ Metals : HNO3
______ : ______

Sampled by: V. DeWilles

Sampling Devices used: Split spoon

Potential Contamination/Interference: ______

Sample History or Special Notes: hold for analysis until 9/22/86

Date Received by Lab: ______ By: ______

Transmitted to Lab by: FEDEX
name title

Phone: ______

Relinquished by: Vanessa DeWilles Date: 9/12/86

Relinquished by: ______ Date: ______

Relinquished by: ______ Date: ______

Relinquished by: ______ Date: ______

Relinquished by: ______ Date: ______

Final Disposition of samples: ______

Date: ______ Location: ______

Instructions: Please fill this form out as completely as possible. When the form is received by the Laboratory request a copy for your file. The abbreviated form for Chain of Custody is used simultaneously as the Analysis Request Form for the above sample or sample group.

Addendum to Chain of Custody Record (G-6)
Composite Soil Sample From Drum

Sample Numbers:	AFP 59, SW-3, Drum Composite, Hart 013
Analyses Requested:	EP Toxicity Metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag)
Sample Matrix:	Soil
Preservatives:	None
Date Sampled:	9/12/86
Date Shipped:	9/15/86 delivered by HART
Date Received:	9/15/86 by Princeton Testing Laboratory

(CL5124A/1)

FRED C. HART ASSOCIATES, INC.
630 FIFTH AVENUE
NEW YORK, N.Y. 10036

COPY

CHAIN OF CUSTODY

ML Sample No.: ______

Client Name: FCHA Client No.: 0107[illegible]

Sample Name: [illegible] Soil - SO-3 ([illegible]) Date/Time Sampled: ______

Sample Location: ______

No. of Sample Bottles: 2 Preservatives: ______ General Chem: 4° C; Oil & Grease: HCl; Metals: HNO_3

Temperature: ______

Sampled by: V. DeMiller

Sampling Devices used: [illegible] Trowel

Potential Contamination/Interference: ______

VJD

Sample History or Special Notes: EP TOXICITY - Metals Only

Date Received by Lab: ______ By: ______

Transmitted to Lab by: ______
name title

Phone: ______

Relinquished by: Vanessa DeMiller Date: 9/15/86

Relinquished by: ______ Date: ______

Relinquished by: ______ Date: ______

Relinquished by: ______ Date: ______

Relinquished by: ______ Date: ______

Final Disposition of samples: [illegible]

Date: 9/15/86 12:00 Location: Princeton Testing Labs

Instructions: Please fill this form out as completely as possible. When the form is received by the Laboratory request a copy for your file. The abbreviated form for Chain of Custody is used simultaneously as the Analysis Request Form for the above sample or sample group.

Addendum to Chain of Custody Record (G-8)
Soil Sampling Field Blank

Sample Numbers:	AFP 59, Field Blank, Water, Hart 001
Analyses Requested:	Total Petroleum Hydrocarbons Aromatic and Halogenated Volatile Organic Compounds
Sample Matrix:	Water
Preservatives:	See Table 1 (p.G-15)
Date Sampled:	9/12/86
Date Shipped:	9/12/86 via Federal Express
Date Received:	9/15/86 by Princeton Testing Laboratories

(CL5124A/1)

G-8

FRED C. HART ASSOCIATES, INC.
530 FIFTH AVENUE
NEW YORK, N.Y. 10036

CHAIN OF CUSTODY

ML Sample No.: ________

Client Name: FCHA Client No.: ________

Sample Name: Field Blank Date/Time Sampled: 9/12/86

Sample Location: Johnson City, NY

No. of Sample Bottles: ________ Preservatives: ____ General Chem: 4° C
____ Oil & Grease: HCl
____ Metals : HNO_3
____ ~~[illegible]~~ : ____

Temperature: ________

Sampled by: V. DeVilbez

Sampling Devices used: Split spoon

Potential Contamination/Interference: Analyze for: Aromatic and Halogenated Organics (E601 + E602). Petroleum Hydrocarbons (E418.1)

Sample History or Special Notes: Preservatives: for VOA's - Na_2SO_3; for TPH - H_2SO_4

Date Received by Lab: ________ By: ________

Transmitted to Lab by: ________
name title

Phone: ________

Relinquished by: Vanessa J DeVilbez Date: 9/12/86

Relinquished by: ________ Date: ________

Relinquished by: ________ Date: ________

Relinquished by: ________ Date: ________

Relinquished by: ________ Date: ________

Final Disposition of samples: ________

Date: ________ Location: ________

Instructions: Please fill this form out as completely as possible. When the form is received by the Laboratory request a copy for your file. The abbreviated form for Chain of Custody is used simultaneously as the Analysis Request Form for the above sample or sample group.

Addendum to Chain of Custody Record (G-10)
Groundwater Samples From Monitoring Wells

Sample Numbers:	AFP 59, SW-1, Water, Hart 001 AFP 59, SW-2, Water, Hart 002 AFP 59, SW-3, Water, Hart 003 AFP 59, SW-4, Water, Hart 004 AFP 59, Production Well, Water, Hart 007 AFP 59, Field Blank, Water, Hart 005
Analyses Requested:	Total Petroleum Hydrocarbons Metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag) Aromatic and Halogenated Volatile Organic Compounds Cyanide
Sample Matrix:	Water
Preservatives:	See Table 1 (p. G-15) Metals Sample Filtered in the Field
Date Sampled:	9/23/86
Date Shipped:	9/23/86 via Federal Express
Date Received:	9/24/86 by Princeton Testing Laboratories

(CL5124A/1)

FRED C. HART ASSOCS. (HART)

CHAIN OF CUSTODY RECORD (WATER)

Project # 0037-00-00

Project Name: AFP 59 USAF - Johnson City, NY

Samplers Signature: Vanessa J. DeLilla

Stat.#	Date	Time	Comp	Grab	Station Location	Solids, BOD	COD, TOC	Acid Extract	Inorganic Anions	Metals	Cyanides	Oil & Grease	Organics GC/MS	Base/Neutral	Volatile Organics	Pesticides & PCB's	Bacteriology	Misc. Chem.	# of Containers	REMARKS
																				Parameters
SW-1	9.23.86			X	SW-1 (monitoring Well)					X	X				X					Volatile organics, Petroleum hydrocarbons, cyanide, Priority metals
SW-2					SW-2 (" ")															
SW-3					SW-3 (" ")															
SW-4					SW-4 (" ")															
FIELD BLANK					005															
SW-7					007															

Relinquished by: (signature)	Date/time	Received by: (signature)	Relinquished by: (signature)	Date/time	Received by: (signature)
Vanessa J. DeLilla	9.23.86 / 7:00			9/24/86 3.15	Robert Kerr
Relinquished by: (signature)	Date/time	Received by: (signature)	Relinquished by: (signature)	Date/time	Received by: (signature)

Relinqished by: (signature)	Date/time	Received for laboratory by(signature):	Date/time	REMARKS

Princeton Testing Laboratory, PO Box 3108, Princeton, NJ 08540

Addendum to Chain of Custody Record (G-12)
USAFOEHL Groundwater Monitoring Well Sample Split

Sample Numbers:	AFP 59, SW-2, Water, USAFOEHL 002
Analyses Requested:	Total Petroleum Hydrocarbons Metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag) Aromatic and Halogenated Volatile Organic Compounds Cyanide
Sample Matrix:	Water
Preservatives:	See Table 1 (p.G-15) Metals Sample Filtered in the Field
Date Sampled:	9/23/86
Date Shipped:	9/23/86 via Federal Express
Date Received:	Unknown (no records returned by USAFOEHL)

(CL5124A/1)

CHAIN-OF-CUSTODY

Base Sample No.: AFP59. SW-2, WATER, HART/006

Work Site Identifier: AFP59

BASE CODE: AFP59

BASE: Johnson City, NY

COMMERCIAL PHONE: (512) 536-2158

ADDRESS: 600 Main ST. 13790

AUTOVON: 240-2158/2159

SAMPLING LOCATION: SW-2

COLLECTOR'S NAME: Vanessa J. DeVillez 9/23/86 (4:30p)
(Signature and Date)

DATE SAMPLED: 9/23/86

TIME SAMPLED: 1630 HOURS

TYPE OF PROCESS PRODUCING THE WASTE:

FIELD INFORMATION: Sample collected w/ STAINLESS STEEL BAILER

SHIP TO: USAF OEHL/SA
BLDG 140
BROOKS AFB TX 78235-5501

SHIPPER: V. DeVillez - HART Assocs.

PHONE: 212 840-3990

ADDRESS: 530 Fifth Avenue
NY, NY 10036

CHAIN-OF-POSSESSION:

	SIGNATURE	TITLE	INCLUSIVE DATES
1.	Vanessa J. DeVillez	Hydrogeologist (HART Assocs.)	9/23/86 TO
2.			TO
3.			TO
4.			TO
5.			TO

ENVIRONMENTAL SAMPLING DATA

OEHL USE ONLY

(Use this space for mechanical imprint)

SAMPLING SITE IDENTIFIER (AFR 19-7): A F P 5 | 9 S W 2 | 0 0 6

BASE WHERE SAMPLE COLLECTED: AFP59

SAMPLING SITE DESCRIPTION: AFP59 SW-2 006

DATE COLLECTION BEGAN (YYMMDD)	TIME COLLECTION BEGAN (24 hour clock)	COLLECTION METHOD
9 6 0 9 1 2 1 3	1630	☒ GRAB ☐ COMPOSITE ____ HOURS

MAIL REPORTS TO (circle if changed)		
ORIGINAL	A F P 5 9	USAFOEHL/SA BLDG 140 BROOKS AFB TX 78235-5501
COPY 1		
COPY 2		

SAMPLE COLLECTED BY (Name, Grade, AFSC)	SIGNATURE	AUTOVON
DeVillez - Hydrogeologist - HART ASSOCS	Vanessa DeVilley	240-2158/2159

REASON FOR SUBMISSION: E R — A-ACCIDENT/INCIDENT, R-ROUTINE/PERIODIC, C-COMPLAINT, N-NPDES, F-FOLLOWUP/CLEANUP, O-OTHER (specify)

BASE SAMPLE NUMBER: A F P 5 9 S W 2 — OEHL PID

ANALYSES REQUESTED (Check appropriate blocks)

	GROUP A										
	Ammonia	00610		Hardness	00900		Silica	00955		2, 4, 5-T	39740
	Chemical Oxygen Demand	00340		Iron	01045		Specific Conductance	00095		2, 4, 5-TP-Silvex	39760
	Kjeldahl Nitrogen	00625		Lead	01051		Sulfate	00945			
	Nitrate	00620		Magnesium	00927		Surfactans-MBAS	38260		Primary Metals	
	Nitrite	00615		Manganese	01055		Turbidity	00076			
	Oil & Grease	00560	X	Mercury	71900						
	Organic Carbon	00680		Nickel	01067						
	Orthophosphate	00671		Potassium	00937						
	Phosphorus, Total	00665	X	Selenium	01147		GROUP H				
				Silver	01077		Aldrin	39330			
	GROUP D			Sodium	00929		BHC Isomers	39340			
X	Cyanide, Total	00720		Thallium	01059		a-BHC	39337			
	Cyanide, Free	00722		Zinc	01092		b-BHC	39338			
							d-BHC	34259			
	GROUP E						Chlordane	39350		GROUP J	
	Phenols	32730		GROUP G			DDT Isomers	39370		Sulfides	00745
				Acidity, Total	70508		p, p-DDD	39310			
	GROUP F			Alkalinity, Total	00410		p, p-DDE	39320			
	Antimony	01097		Alkalinity, Bicarbonate	00425		p, p-DDT	39300			
X	Arsenic	01002		Bromide	71870		Dieldrin	39380		ON SITE ANALYSES	
	Barium	01007		Carbon Dioxide	00405		Dursban	77969		PARAMETER	VALUE
	Beryllium	01012		Chloride	00940		Endrin	39390		Flow 50050	mgd
	Boron	01022		Color	00080		Heptachlor	39410		Chlorine, Total 50060	mg/l
	Cadmium	01027		Fluoride	00951		Heptachlor Epoxide	39420		Dissolved Oxygen 00300	mg/l
	Calcium	00916		Residue, Total	00500		Lindane	39782		pH 00400	units
	Chromium, Total	01034		Residue, Filterable (TDS)	70300		Methoxychlor	39480		Temperature 00010	°C
	Chromium VI	01032		Residue, Nonfilterable	00530		Pramitol (Prometon)	XY4200000		Odor 00086	
	Copper	01042		Residue, Settleable	50085		Toxaphene	39400		Iodide 71865	
				Residue, Volatile	00505		2, 4-D	39730		Sulfite 00740	

REMARKS: Field Filtered for metals

AF FORMS 2752A AND 2752B, FEB 10, REPLACE AF FORM 2752, JAN 81, WHICH WILL BE USED.

ENVIRONMENTAL SAMPLING DATA
(TRACE ORGANICS)

G-14 OEHL USE ONLY

(Use this space for mechanical imprint)

SAMPLING SITE IDENTIFIER (AFR 19-7): A F P 5 9 S W 2 0 0 6

BASE WHERE SAMPLE COLLECTED: AFP59

SAMPLING SITE DESCRIPTION: AFP59

DATE COLLECTION BEGAN (YYMMDD)	TIME COLLECTION BEGAN (24 hour clock)	COLLECTION METHOD
8 6 0 9 2 3	1630	☒ GRAB ☐ COMPOSITE ______ HOURS

MAIL REPORTS TO (circle if changed)			
	ORIGINAL	A F P 5 9	USAFOEHL/SA BLDG 140 BROOKS AFB TX 78235-5501
	COPY 1		
	COPY 2		

SAMPLE COLLECTED BY (Name, Grade, AFSC)	SIGNATURE	AUTOVON
DeVillez - Hydrogeologist - HART Assocs.	[signature]	240-2158/2159

REASON FOR SUBMISSION: R

A-ACCIDENT/INCIDENT C-COMPLAINT F-FOLLOWUP/CLEANUP
R-ROUTINE/PERIODIC N-NPDES O-OTHER (specify) ______

BASE SAMPLE NUMBER: A F P 5 9 S W 2 OEHL PID

ANALYSES REQUESTED (check appropriate blocks)

	VOLATILE HALOCARBONS (VOH)	(10860)		Trichlorofluoromethane	34488		MISCELLANEOUS	
	PRES GROUP T1			Vinyl Chloride	39175		VOLATILES	
X	Volatile Halocarbon Screen	1001460PH					PRES GROUP T1	
	Bromodichloromethane	32101					Xylene	81710
	Bromoform	32104					Methylethyl ketone	81595
	Bromomethane	34413		TRIHALOMETHANES (THM)	(10860)		Methylisobutyl ketone	81596
	Carbon Tetrachloride	32102		PRES GROUP T1			Total organic halides	1002106OH
	Chlorobenzene	34301		Trihalomethane Potential	1001465MT			
	Chloroethane	34311		Total Trihalomethanes	82080			
	2-Chloroethylvinyl ether	34576						
	Chloroform	32106		VOLATILE AROMATICS (VOA)	(10850)			
	Chloromethane	34418		PRES GROUP T1				
	Dibromochloromethane	32105	X	Volatile Aromatic Screen	1001461PA			
	1, 2-dichlorobenzene	34536		Benzene	34030		MISCELLANEOUS	
	1, 3-dichlorobenzene	34566		Chlorobenzene	34301		EXTRACTABLES	
	1, 4-dichlorobenzene	34571		1, 2-dichlorobenzene	34536		PRES GROUP T4	
	Dichlorodifluoromethane	34668		1, 3-dichlorobenzene	34566		PCB's	39516
	1, 1-dichloroethane	34496		1, 4-dichlorobenzene	34571		Phthalate Esters Screen	1000069PH
	1, 2-dichloroethane	34531		Ethylbenzene	34371		bis (2-ethylhexyl) phthalate	39100
	1, 1-dichloroethene	34501		Toluene	34010		Butyl Benzyl phthalate	34292
	trans-1, 2-dichloroethene	34546					Di-n-butyl phthalate	39110
	1, 2-dichloropropane	34541					Diethyl phthalate	34336
	cis-1, 3-dichloropropene	34704					Dimethyl phthalate	34341
	trans-1, 3-dichloropropene	34699					Di-n-octyl phthalate	34596
	Methylene Chloride	34423						
	1, 1, 2, 2-tetrachloroethane	34516						
	Tetrachloroethylene	34475				X	PETROLEUM HYDROCARBONS	
	1, 1, 1-trichloroethane	34506						
	1, 1, 2-trichloroethane	34511						
	Trichloroethylene	39180						

REMARKS

AF FORM FEB 85 2752B AF FORMS 2752A AND AF 2752B, FEB 85, REPLACE AF FORM 2752, JAN 81, WHICH WILL BE USED.

TABLE 1

SAMPLE CONTAINERS AND PRESERVATION

Parameter	Volume Required	Container	Preservative	Holding Time
Total Petroleum Hydrocarbons	1 liter	glass	H_2SO_4 to pH <2	28 Days
Primary Metals	1 liter	HDPE	Filter on-site HNO_3 to pH <2	6 months
Volatile Organics	2 bottles	VOA vials	2-3 crystals $Na_2S_2O_3$	14 days
Cyanide	500 ml	glass	NaOH to pH >12	14 days

(CL5119A/1)

APPENDIX H

ANALYTICAL DATA

(0472n-27)

SUBSURFACE SOIL SAMPLE CROSS REFERENCE TABLE

PTL Sample Number	HART Sample Number	Date Sampled	Date Received	Date of Extraction	Date of Analysis	Type of Analysis	Page	Holding Time Recommended/Actual (days)
001	AFP59, SW-1 18' - 20' Hart 004 SS-7[a]	09/09/86	09/15/86	09/22-23/86	09/30/86	As, Ba, Cd, Cr, Pb	H.1-1	180/14
				09/22-23/86	09/29/86	Se, As	H.1-1	180/14
				09/22-23/86	09/29/86	Hg	H.1-1	28/14
				NA	10/02/86	Petroleum Hydrocarbons	H.1-1	28/23
				09/24/86	09/25/86	Cyanide	H.1-1	14/15
				NA	09/19/86	EPA 601/602	H.3-1	14/10
002	AFP59, SW-1 24' - 26' Hart 007 SS-10	09/09/86	09/15/86	09/22-23/86	09/30/86	As, Ba, Cd, Cr, Pb	H.1-1	180/14
				09/22-23/86	09/29/86	Se, Ag	H.1-1	180/14
				09/22-23/86	09/29/86	Hg	H.1-1	28/14
				NA	10/02/86	Petroleum Hydrocarbons	H.1-1	28/23
				09/24/86	09/25/86	Cyanide	H.1-1	14/15
				NA	09/19/86	EPA 601/602	H.3-1	14/10
003	AFP59, SW-2 22' - 24' Hart 009 SS-9	09/11/86	09/15/86	09/22-23/86	09/30/86	As, Ba, Cd, Cr, Pb	H.1-1	180/12
				09/22-23/86	09/29/86	Se, Ag	H.1-1	180/12
				09/22-23/86	09/29/86	Hg	H.1-1	28/12
				NA	10/02/86	Petroleum Hydrocarbons	H.1-1	28/21
				09/24/86	09/25/86	Cyanide	H.1-1	14/13
				NA	09/19/86	EPA 601/602	H.3-1	14/8

NA - Not Applicable
(a) - Sample split-spoon number from boring logs (Appendix E.1)

SUBSURFACE SOIL SAMPLE CROSS REFERENCE TABLE

PTL Sample Number	HART Sample Number	Date Sampled	Date Received	Date of Extraction	Date of Analysis	Type of Analysis	Page	Holding Time Recommended/Actual (days)
	AFP59, SW-1	09/09/86	09/15/86	09/22-23/86	09/30/86	As, Ba, Cd,	H.1-1	180/14
	18' - 20'					Cr, Pb		
	Hart 004			09/22-23/86	09/29/86	Se, As	H.1-1	180/14
	SS-7(a)			09/22-23/86	09/29/86	Hg	H.1-1	28/14
				NA	10/02/86	Petroleum	H.1-1	28/23
						Hydrocarbons		
				09/24/86	09/25/86	Cyanide	H.1-1	14/15
001				NA	09/19/86	EPA 601/602	H.3-1	14/10
	AFP59, SW-1	09/09/86	09/15/86	09/22-23/86	09/30/86	As, Ba, Cd,	H.1-1	180/14
	24' - 26'					Cr, Pb		
	Hart 007			09/22-23/86	09/29/86	Se, Ag	H.1-1	180/14
	SS-10			09/22-23/86	09/29/86	Hg	H.1-1	28/14
				NA	10/02/86	Petroleum	H.1-1	28/23
						Hydrocarbons		
				09/24/86	09/25/86	Cyanide	H.1-1	14/15
002				NA	09/19/86	EPA 601/602	H.3-1	14/10
	AFP59, SW-2	09/11/86	09/15/86	09/22-23/86	09/30/86	As, Ba, Cd,	H.1-1	180/12
	22' - 24'					Cr, Pb		
	Hart 009			09/22-23/86	09/29/86	Se, Ag	H.1-1	180/12
	SS-9			09/22-23/86	09/29/86	Hg	H.1-1	28/12
				NA	10/02/86	Petroleum	H.1-1	28/21
						Hydrocarbons		
				09/24/86	09/25/86	Cyanide	H.1-1	14/13
003				NA	09/19/86	EPA 601/602	H.3-1	14/8

NA - Not Applicable
(a) - Sample split-spoon number from boring logs (Appendix E.1)

Subsurface Soil Sample Cross Reference Table (Continued)

PTL Sample Number	HART Sample Number	Date Sampled	Date Received	Date of Extraction	Date of Analysis	Type of Analysis	Page	Holding Time Recommended/Actual (days)
	AFP59, SW-2	09/11/86	09/15/86	09/22-23/86	09/30/86	As, Ba, Cd,	H.1-1	180/12
	24' - 26'					Cr, Pb		
	Hart 010			09/22-23/86	09/29/86	Se, Ag	H.1-1	180/12
	SS-10			09/22-23/86	09/29/86	Hg	H.1-1	28/12
				NA	10/02/86	Petroleum	H.1-1	28/21
						Hydrocarbons		
				09/24/86	09/25/86	Cyanide	H.1-1	14/13
004				NA	09/19/86	EPA 601/602	H.3-3	14/8
	AFP59, SW-3	09/10/86	09/15/86	09/22-23/86	09/30/86	As, Ba, Cd,	H.1-1	180/13
	22' - 24'					Cr, Pb		
	Hart 009			09/22-23/86	09/29/86	Se, Ag	H.1-1	180/13
	SS-9			09/22-23/86	09/29/86	Hg	H.1-1	28/13
				NA	10/02/86	Petroleum	H.1-1	28/22
						Hydrocarbons		
				09/24/86	09/25/86	Cyanide	H.1-1	14/14
005				NA	09/19/86	EPA 601/602	H.3-3	14/9
	AFP59, SW-3	09/10/86	09/15/86	09/22-23/86	09/30/86	As, Ba, Cd,	H.1-1	180/13
	24' - 26'					Cr, Pb		
	Hart 010			09/22-23/86	09/29/86	Se, Ag	H.1-1	180/13
	SS-10			09/22-23/86	09/29/86	Hg	H.1-1	28/13
				NA	10/02/86	Petroleum	H.1-1	28/22
						Hydrocarbons		
				09/24/86	09/25/86	Cyanide	H.1-1	14/14
006				NA	09/19/86	EPA 601/602	H.3-3	14/9

(CL5099A/12)

Subsurface Soil Sample Cross Reference Table (Continued)

PTL Sample Number	HART Sample Number	Date Sampled	Date Received	Date of Extraction	Date of Analysis	Type of Analysis	Page	Holding Time Recommended/Actual (days)
	AFP59, SW-4 22' - 24' Hart 001	09/10/86	09/15/86	09/22-23/86	09/30/86	As, Ba, Cd, Cr, Pb	H.1-2	180/13
				09/22-23/86	09/29/86	Se, Ag	H.1-2	180/13
				09/22-23/86	09/29/86	Hg	H.1-2	28/13
				NA	10/02/86	Petroleum Hydrocarbons	H.1-2	28/22
				09/24/86	09/25/86	Cyanide	H.1-2	14/14
007				NA	09/19/86	EPA 601/602	H.3-5	14/9
	AFP59, SW-3 Drum Composite Hart 013	09/12/86	09/15/86	09/22/86	09/25/86	As, Ba, Cd, Cr, Pb, Hg, Se, Ag	H.1-5	180/10
	AFP59, SB-1 2' - 4' Hart 002	09/12/86	09/13/86	10/1-2/86	10/09/86	Hg	H.1-3	28/20
				10/1-2/86	10/07/86	Se	H.1-3	180/20
				09/25-26/86	09/30/86	Total Cr	H.1-3	180/14
				10/1-2/86	10/08/86	As, Ba, Cd, Cr, Pb, Ag	H.1-3	180/20
	AFP59, SB-1 4' - 6' Hart 003 SS-3	09/12/86	09/13/86	10/1-2/86	10/09/86	Hg	H.1-3	28/20
				10/1-2/86	10/07/86	Se	H.1-3	180/20
				09/25-26/86	09/30/86	Total Cr	H.1-3	180/14
				10/1-2/86	10/08/86	As, Ba, Cd, Cr, Pb, Ag	H.1-3	180/20

(CL5099A/12)

Subsurface Soil Sample Cross Reference Table (Continued)

PTL Sample Number	HART Sample Number	Date Sampled	Date Received	Date of Extraction	Date of Analysis	Type of Analysis	Page	Holding Time Recommended/Actual (days)
	AFP59, SB-2 0.5' - 2' Hart 001 SS-1	09/12/86	09/13/86	10/1-2/86	10/09/86	Hg	H.1-3	28/20
				10/1-2/86	10/07/86	Se	H.1-3	180/20
				09/25-26/86	09/30/86	Total Cr	H.1-3	180/14
				10/1-2/86	10/08/86	As, Ba, Cd, Cr, Pb, Ag	H.1-3	180/20
	AFP59, SB-2 6' - 8' Hart 004 SS-4	09/12/86	09/13/86	10/1-2/86	10/09/86	Hg	H.1-3	28/20
				10/1-2/86	10/07/86	Se	H.1-3	180/20
				09/25-26/86	09/30/86	Total Cr	H.1-3	180/14
				10/1-2/86	10/08/86	As, Ba, Cd, Cr, Pb, Ag	H.1-3	180/20
	AFP59, SB-3 2' - 4' Hart 001 SS-2	09/12/86	09/13/86	10/1-2/86	10/09/86	Hg	H.1-3	28/20
				10/1-2/86	10/07/86	Se	H.1-3	180/20
				09/25-26/86	09/30/86	Total Cr	H.1-3	180/14
				10/1-2/86	10/08/86	As, Ba, Cd, Cr, Pb, Ag	H.1-3	180/20
	AFP59, SB-3 8' - 10' Hart 004 SS-5	09/12/86	09/13/86	10/1-2/86	10/09/86	Hg	H.1-4	28/20
				10/1-2/86	10/07/86	Se	H.1-4	180/20
				09/25-26/86	09/30/86	Total Cr	H.1-3	180/14
				10/1-2/86	10/08/86	As, Ba, Cd, Cr, Pb, Ag	H.1-4	180/20

Subsurface Soil Sample Cross Reference Table (Continued)

PTL Sample Number	HART Sample Number	Date Sampled	Date Received	Date of Extraction	Date of Analysis	Type of Analysis	Page	Holding Time Recommended/Actual (days)
	AFP59, SW-1	09/09/86	09/13/86	10/1-2/86	10/09/86	Hg	H.1-4	28/23
	20' - 22'			10/1-2/86	10/07/86	Se	H.1-4	180/23
	Hart 005			09/25-26/86	09/30/86	Total Cr	H.1-4	180/17
	SS-8			10/1-2/86	10/08/86	As, Ba, Cd, Cr, Pb, Ag	H.1-4	180/23
	Plating Rm.	09/10/86	09/13/86	10/1-2/86	10/09/86	Hg	H.1-4	28/22
	East - 2			10/1-2/86	10/07/86	Se	H.1-4	180/22
	GE 002			09/25-26/86	09/30/86	Total Cr	H.1-4	180/16
				10/1-2/86	10/08/86	As, Ba, Cd, Cr, Pb, Ag	H.1-4	180/22
Field Blk 1 Field Blk 2	AFP59, Field Blank, Water, Hart 001	09/09/86	09/15/86	NA	09/19/86	EPA 601/602	H.3-7	14/10

GROUNDWATER SAMPLE CROSS REFERENCE TABLE

PTL Sample Number	HART Sample Number	Date Sampled	Date Received	Date of Analysis	Date of Confirmation	Type of Analysis	Page	Holding Time Recommended/Actual (days)
001	AFP59, SW-1 Water, Hart 001	09/23/86	09/24/86	10/03/86	NA	EPA 601/602	H.3-10	14/10
				09/25/86	NA	Ag, Ba, Cd, Cr, Pb	H.1-6	180/2
				09/29/86	NA	As, Se	H.1-6	180/6
				09/29/86	NA	Hg	H.1-6	28/6
				10/06/86	NA	Cyanide	H.1-6	14/13
				10/15/86	NA	Petroleum Hydrocarbons	H.1-6	28/22
002	AFP59, SW-2 Water, Hart 002	09/23/86	09/24/86	10/03/86	NA	EPA 601/602	H.3-10	14/10
				09/25/86	NA	Ag, Ba, Cd, Cr, Pb	H.1-6	180/2
				09/29/86	NA	As, Se	H.1-6	180/6
				09/29/86	NA	Hg	H.1-6	28/6
				10/06/86	NA	Cyanide	H.1-6	14/13
				10/15/86	NA	Petroleum Hydrocarbons	H.1-6	28/22
003	AFP59, SW-3 Water, Hart 003	09/23/86	09/24/86	10/03/86	10/04/86	EPA 601/602	H.3-10	14/10
				09/25/86	NA	Ag, Ba, Cd, Cr, Pb	H.1-6	180/2
				09/29/86	NA	As, Se	H.1-6	180/6
				09/29/86	NA	Hg	H.1-6	28/6
				10/06/86	NA	Cyanide	H.1-6	14/13
				10/15/86	NA	Petroleum Hydrocarbons	H.1-6	28/22

NA - Not Applicable

(CL5099A/12)

Groundwater Sample Cross Reference Table (Continued)

PTL Sample Number	HART Sample Number	Date Sampled	Date Received	Date of Analysis	Date of Confirmation	Type of Analysis	Page	Holding Time Recommended/Actual (days)
004	AFP59, SW-4 Water, Hart 004	09/23/86	09/24/86	10/03/86	NA	EPA 601/602	H.3-12	14/10
				09/25/86	NA	Ag, Ba, Cd, Cr, Pb	H.1-6	180/2
				09/29/86	NA	As, Se	H.1-6	180/6
				09/29/86	NA	Hg	H.1-6	28/6
				10/06/86	NA	Cyanide	H.1-6	14/13
				10/15/86	NA	Petroleum Hydrocarbons	H.1-6	28/22
005	AFP59, Production Well, Water Hart 007	09/23/86	09/24/86	10/03/86	10/04/86	EPA 601/602	H.3-12	14/10
				09/25/86	NA	Ag, Ba, Cd, Cr, Pb	H.1-6	180/2
				09/29/86	NA	Hg	H.1-6	28/6
				09/29/86	NA	As, Se	H.1-6	180/6
				10/06/86	NA	Cyanide	H.1-6	14/13
				10/15/86	NA	Petroleum Hydrocarbons	H.1-6	28/22
Field Blk	AFP59, Field Blank	09/23/86	09/24/86	10/03/86	NA	EPA 601/602	H.3-12	14/10
Field Blk	Water Hart 005			10/15/86	NA	Petroleum Hydrocarbons	H.1-6	28/22

(CL5099A/12)

APPENDIX H.1

PTL INORGANIC ANALYTICAL RESULTS

(CL5121A)

609 452 9050

princeton testing laboratory

Princeton Service Center, US Route One, Princeton, NJ 08540 • Mailing Address: PO Box 3108, Princeton, NJ 08543

DATE: October 23, 1986

JOB NO. 86GW2873

AUTHORIZATION: PO 01071-00-8600

SAMPLE: Soil - 7

TO: Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Attn: Robert Goldman

REPORT OF ANALYSIS

SAMPLING DATE: ~~9/12/86~~ 9/9/86 - 9/11/86 KS/EA
EXTRACTION : 9/22-23/86

EP TOXICITY (METALS)	AFP 59 SW-1 18'-20' Hart 004	AFP 59 SW-1 24'-26' Hart 007	AFP 59 SW-2 22'-24' Hart 009	AFP 59 SW-2 24'-26' Hart 010	AFP 59 SW-3 22'-24' Hart 009	AFP 59 SW-3 24'-26' Hart 010
Arsenic	0.02	0.02	0.01	0.01	<0.01	0.03
Barium	0.52	0.44	0.35	0.20	0.14	0.50
Cadmium	0.04	0.02	0.02	0.01	0.02	0.06
Chromium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Lead	0.16	0.15	0.03	0.03	0.05	0.18
Mercury	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	<0.01	0.01	<0.01	<0.01	<0.01	0.01
Silver	0.01	<0.01	<0.01	<0.01	<0.01	0.01
			mg/kg			
Petroleum Hydrocarbons	<10.0	11.4	<10.0	<10.0	<10.0	<10.0
Cyanide	< 0.35	< 0.35	< 0.35	< 0.35	< 0.35	< 0.35

Received 9/15/86

Edna A. Alinea
Edna A. Alinea, Manager
Water, Wastewater & Microbiology

/rk

NOTE: RCRA Method employed according to Federal Register May 19, 1980.

<— less than >— greater than ND — not detected

Princeton Service Center
U.S. Route 1
609-452-4051
TLX 843492

princeton testing laboratory

P.O. Box 3108, Princeton, NJ 08540

DATE: 10-23-86

JOB NO. 86GW2873

AUTHORIZATION: 01071-00-86007-C

SAMPLE: Soil-7

TO:

Fred C. Hart Associates
530 Fifth Avenue
New York NY 10036
Attn: Robert Goldman

REPORT OF ANALYSIS

EP-TOXICITY (METALS)	AFP 59 SW-4 22'-24' Hart 001	AFP 59 Field Blank Water Hart 001	DATE OF ANALYSIS	DETECTION LIMIT (mg/l)
Arsenic	<0.01	---	9/30/86	0.01
Barium	0.10	---	9/30/86	0.05
Cadmium	0.02	---	9/30/86	0.01
Chromium	<0.02	---	9/30/86	0.02
Lead	0.06	---	9/30/86	0.02
Mercury	<0.001	---	9/29/86	0.001
Selenium	<0.01	---	9/29/86	0.01
Silver	<0.01	---	9/29/86	0.01
mg/kg				
Cyanide	<0.35	---	9/24 Distillation	0.35
Petroleum Hydrocarbons	<10.0	<.5	9/25 Colorimetric 10/2/86	10.0

Note: RCRA Method employed according to Federal Register May 19, 1980.

Sampling Date : ~~9/11/86 - 9/12/86~~ 9/9/86 - 9/12/86 KS/EA

Extration Date : 9/22-23/86

Sample Received : 9-15-86

Edna A. Alinea

Edna A. Alinea, Manager
Water, Wastewater and Microbiology

William F. Pickup, Director

< less than < ND – element is less than the value given and not detected by the technique employed > greater than

Princeton Service Center
U.S. Route 1
[illegible]
[illegible]

princeton testing laboratory

P.O. B[illegible]

DATE: 10-13-86

JOB NO. 86W2971

AUTHORIZATION: 01071-00-86007

SAMPLE: Soil-8

TO:

Fred C. Har Associates
530 Fifth Avenue
New York NY 10036
Attn: Robert Goldman

REPORT OF ANALYSIS

EP-TOXICITY:	AFP 59 SB-1 2'-4' HART 002	AFP 59 SB-1 4'-6' HART 003	AFP 59 SB-2 0.5'-2' HART 001	AFP 59 SB-2 6'-8' HART 004	AFP 59 SB-3 2'-4' HART 001
mg/1					
Arsenic	<0.01	<0.01	0.01	0.01	0.01
Barium	<0.05	<0.05	<0.05	0.06	<0.05
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	<0.02	<0.02	<0.02	<0.02	<0.02
Lead	<0.02	0.08	0.06	0.10	0.04
Mercury	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01
mg/kg					
Total Chromium	7.70	12.4	12.6	16.1	18.0

Note: RCRA Method employed according to Federal Register May 19, 1980.

Edna A. Alinea

Edna A. Alinea, Manager
Water, Wastewater and Microbiology

W[illegible] Director

< [illegible] ND – element is less than the value given and not detected by the technique employed > greater than

Princeton Service Center
U.S. Route 1
609-452-9050
TELEX 843442

princeton testing laboratory

P.O. Box 3108, Princeton, N.J. 08540

DATE: 10-13-86

JOB NO. 86W2971

AUTHORIZATION: 01071-00-86007

SAMPLE: Soil-8

TO: Fred C. Hart Associates
530 Fifth Avenue
New York NY 10036
Attn: Robert Goldman

REPORT OF ANALYSIS

EP-TOXICITY:	AFP 59 SB-3 8'-10' HART 004	AFP 59 SW-1 20'-22' HART 005	Plating Room East-2 GE 002	Date of Analysis
mg/kg				
Arsenic	<0.01	0.01	0.02	AA - 10/8/86
Barium	<0.05	0.51	0.19	10/8/86
Cadmium	<0.01	0.02	<0.01	10/8/86
Chromium	<0.02	0.02	<0.02	10/8/86
Lead	0.07	0.78	0.31	10/8/86
Mercury	<0.001	<0.001	<0.001	10/9/86
Selenium	<0.01	0.01	<0.01	10/7/86
Silver	<0.01	0.01	<0.01	10/8/86
mg/kg Total Chromium	67.4	5.43	43.6	Digestion 9/25 - 9/26/86 AA 9/30/86

should be mg/L - Conversation RDG & Edna Alinea 1/20/87

MDL - 1.0

Note: RCRA Method employed according to Federal Register May 19, 1980.

Date of Sampling : 9/9/86 - 9/12/86 KS/EA

Date of Extraction: 10/1-2/86 JR/EA

Date Received: 9/13/86 KS/EA

Edna A. Alinea

Edna A. Alinea, Manager
Water, Wastewater and Microbiology

William F. Pickup Director

< - less than   ND - element is less than the value given and not detected by the technique employed   > - greater than

RECEIVED OCT 1 4 1986

princeton testing laboratory

Princeton Service Center, US Route One, Princeton, NJ 08540 • Mailing Address PO Box 3108, Princeton NJ 08543

DATE: October 10, 1986

JOB NO. 86W2872 (Corrected)

AUTHORIZATION: 01071-00-86007-00

SAMPLE: Soil - 1

TO: Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036
Attn: Alexis Alfasso

REPORT OF ANALYSIS

	SW-3 Drum Composite Hart 013	Date of Analysis
EP TOXICITY (Metals Only)	mg/l	
Arsenic	0.02	9/25
Barium	0.39	9/25
Cadmium	0.04	9/25
Chromium	< 0.02	9/25
Lead	0.71	9/25
Mercury	< 0.001	9/28
Selenium	< 0.01	9/25
Silver	0.01	9/25

Date of Sampling: 9/12/86

Date of Sample Extraction: 9/22/86

Date Received: 9/15/86

Edna A. Alinea

EDNA A. ALINEA, Manager
Water, Waste Water & Microbiology

<—less than >—greater than ND—not detected

princeton testing laboratory

Princeton Service Center, US Route One, Princeton, NJ 08540 • Mailing Address PO Box 3108, Princeton, NJ 08543

DATE: 10-20-86

JOB NO. 86GW2970

AUTHORIZATION: 01071-00-36007

SAMPLE: Water-5 (Johnson City Proje

TO: Fred C. Hart Associates
530 Fifth Avenue
New York NY 10036
Attn: Robert Goldman

REPORT OF ANALYSIS

	ANALYSIS DATE	AFP 59 SW-1 Water Hart 001	AFP 59 SW-2 Water Hart 002	AFP 59 SW-3 Water Hart 003	AFP 59 SW-4 Water Hart 004	AFP 59 Production Well Water Hart 007	AFP 59 Field Blank Water Hart 00
Silver E 200.7	9/25	<0.01	<0.01	<0.01	<0.01	<0.01	---
Barium " "	9/25	0.21	<0.01	0.05	<0.01	0.14	---
Cadmium " "	9/25	~~<0.005~~ 0.007 ks/EA	~~0.005~~ 0.01 ks/EA	<0.005	<0.005	<0.005	---
Lead " "	9/25	0.30	0.03	0.14	0.07	0.13	---
Arsenic E 206.2	9/29	0.02	<0.005	0.01	0.01	0.01	---
Mercury E 245.1	9/29	<0.001	<0.001	<0.001	<0.001	<0.001	---
Selenium E 270.2	9/29	<0.005	<0.005	<0.005	<0.005	<0.005	---
Chromium E 200.7	9/35	<0.02	<0.02	<0.02	<0.02	<0.02 ks/EA	
Petroleum Hydrocarbon E 418.1	10/15	<0.5	<0.5	<0.5	<0.5	0.6	<0.5
Cyanide A4120	10/6	<0.01	<0.01	<0.01	<0.01	<0.01	---

Date Sampled : 9-23-86

Date Received : ~~9-23-86~~ 9/24/86 ks/EA

Edna A. Alinea

Edna A. Alinea, Manager
Water, Wastewater and Microbiology

<— less than >— greater than ND — not detected

APPENDIX H.2

PTL INORGANIC ANALYTICAL QA/QC RESULTS

(CL5121A)

609 452 9050

princeton testing laboratory

Princeton Service Center, US Route One, Princeton, NJ 08540 • Mailing Address. PO Box 3108, Princeton, NJ 08543

DATE: October 13, 1986

JOB NO. 86W2971

AUTHORIZATION: 01071-00-86007-00

SAMPLE: Soil

TO: Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036
Attn: Robert Goldman

REPORT OF ANALYSIS

QA/QC DATA

AFP 59, SB-3, 8'-10', HART 004

ELEMENT	DUP I	DUP II	Spike Solution Added	Spiked Sample Result	% Recovery
Arsenic	< 0.01	< 0.01	0.100	0.084	84%
Barium	< 0.05	< 0.05	0.170	0.163	96%
Cadmium	< 0.01	< 0.01	0.170	0.17	100%
Chromium	< 0.02	< 0.02	0.17	0.17	100%
Lead	0.07	0.07	0.170	0.24	100%
Mercury	< 0.001	< 0.001	0.005	0.0046	92%
Selenium	< 0.01	< 0.01	0.100	0.089	89%
Silver	< 0.01	< 0.01	0.170	0.15	88%

Edna A. Alinea

EDNA A. ALINEA, Manager
Water, Waste Water & Microbiology

<— less than >— greater than ND — not detected

princeton testing laboratory

Princeton Service Center, US Route One, Princeton, NJ 08540 • Mailing Address PO Box 3108 Princeton NJ 08543

DATE: 10-20-86

JOB NO. 86GW2970

AUTHORIZATION:

SAMPLE: Quality Control

TO:

Fred C. Hart Associates
530 Fifth Avenue
New York NY 10036
Attn: Robert Goldman

REPORT OF ANALYSIS

QUALITY CONTROL

mg/1

SW-1

ELEMENT	DUP 1	DUP II	SPIKE SOLUTION ADDED	SPIKE SOLUTION SAMPLE	% RECOVERY
Silver	<0.01	<0.01	0.17	0.15	88
Barium	0.21	0.21	0.17	0.36	88
Cadmium	<0.005	<0.005	0.17	0.17	100
Chromium	<0.02	<0.02	0.17	0.16	94
Lead	0.30	0.29	0.17	0.45	88
Arsenic	0.022	0.021	0.100	0.110	88
Mercury	<0.001	<0.001	0.0050	0.0049	98
Selenium	<0.005	<0.005	0.100	0.090	90
Cyanide #3054 Job	<0.01	<0.01	.09	.08	89

Edna A. Alinea

Edna A. Alinea, Manager
Water, Wastewater and Microbiology

< — less than > — greater than ND — not detected

APPENDIX H.3

PTL ORGANIC ANALYTICAL RESULTS

(CL5121A)

PRINCETON TESTING LABORATORY
SAMPLE ANALYSIS REPORT

For Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Report Date: 10/23/86
Job No.: 86GW[illegible]
Date Received: 09/15/86
Units: UG/KG

Hart sample nos. at bottom of page

TEST PERFORMED: Vol. Halocarbons & Aromatics, Non-Aq. - 8010/8020

	COMPOUND	DET LMTS	001	002	003
74-87-3	Chloromethane	800	ND	ND	ND
74-83-9	Bromomethane	400	ND	ND	ND
75-71-8	Dichlorodifluoro-methane	200	ND	ND	ND
75-01-4	Vinyl Chloride	80	ND	ND	ND
75-00-3	Chloroethane	80	ND	ND	ND
75-09-2	Methylene Chloride	200	ND	ND	ND
75-69-4	Trichlorofluoro-methane	200	ND	ND	ND
75-35-4	1,1-Dichloroethene	40	ND	ND	ND
75-34-3	1,1-Dichloroethane	40	ND	ND	ND
56-60-5	Trans-1,2-Dichlo-oethene	40	ND	ND	ND
67-66-3	Chloroform	40	ND	ND	ND
107-06-2	1,2-Dichloroethane	40	ND	ND	ND
71-55-6	1,1,1-Trichloro-ethane	80	ND	ND	ND
56-23-5	Carbon Tetra-chloride	80	ND	ND	ND
75-27-4	Bromodichlor-methane	80	ND	ND	ND
78-87-5	1,2-Dichloro-propane	40	ND	ND	ND
10061-02-6	Trans-1,3-Dichlor-opropene	200	ND	ND	ND
79-01-6	Trichloroethene	80	ND	ND	ND
124-48-1	Dibromochloro-methane	80	ND	ND	ND
79-00-5	1,1,2-Trichloro-ethane	200	ND	ND	ND
10061-01-5	cis-1,3-Dichloro-propene	200	ND	ND	ND
100-75-8	2-Chloroethyl-vinylether	200	ND	ND	ND
75-25-2	Bromoform	400	ND	ND	ND
79-34-5	1,1,2,2-Tetra-chloroethane	400	ND	ND	ND
127-18-4	Tetrachloroethene	80	ND	ND	ND
71-43-2	Benzene	40	ND	ND	ND
108-88-3	Toluene	40	ND	ND	ND

"Confirmation analyses MDLs are the same as the 8010/8020 MDL's"

	001	002	003
	AFP 59	AFP 59	AFP 59
	SW-1	SW-1	SW-2
	18'-20'	24'-26'	22'-24'
	Hart 004	Hart 007	Hart 009

PRINCETON TESTING LABORATORY

SAMPLE ANALYSIS REPORT

For: Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Report Date: 10/23/86

Job No.: 86GA0[illegible]
Date Received: 09/15/86
Units: UG/KG

Hart sample nos. at bottom of page

TEST PERFORMED: Vol. Halocarbons & Aromatics, Non-Aq.- 8010/8020

COMPOUND		DET LMTS	001	002	003
108-90-7	Chlorobenzene	40	ND	ND	ND
100-41-4	Ethylbenzene	40	ND	ND	ND
541-73-1	1,3-Dichloro-benzene	40	ND	ND	ND
95-50-1	1,2-Dichloro-benzene	40	ND	ND	ND
106-46-7	1,4-Dichloro-benzene	40	ND	ND	ND

SURROGATE RECOVERY DATA % RECOVERY	AFP 59 SW-1 18'-20' Hart 004	AFP 59 SW-1 24'-26' Hart 007	AFP 59 SW-2 22'-24' Hart 009
Bromochloromethane			
4-Bromofluorobenzene			
DATE RECEIVED:	9/15/86	9/15/86	9/15/86
DATE ANALYZED:	9/19/86	9/19/86	9/19/86
MDL MULTIPLIER:	1	1	1

SPIKE COMPOUNDS % RECOVERY			
Vinyl Chloride	N/A	N/A	N/A
1,1-Dichloroethene	N/A	N/A	N/A
1,2-Dichloroethane	N/A	N/A	N/A
Trichloroethene	N/A	N/A	N/A
1,1,1-Trichloroethane	N/A	N/A	N/A
Benzene	N/A	N/A	N/A
1,4-Dichlorobenzene	N/A	N/A	N/A
Carbon Tetrachloride	N/A	N/A	N/A

"Confirmation analyses MDLs are the same as the 8010/8020 MDL's"

PRINCETON TESTING LABORATORY

SAMPLE ANALYSIS REPORT

For: Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Report Date: 10/23/86

Job No.: 863W0071
Date Received: [illegible]
Units: [illegible]

Hart sample nos. at bottom of page

TEST PERFORMED: Volatile Halocarbons & Aromatics, Non-Aqu - 8010 8020

COMPOUND		DET LMTS	004	005	006
74-87-3	Chloromethane	[illegible]	ND	ND	ND
74-83-9	Bromomethane	[illegible]	ND	ND	ND
75-71-8	Dichlorodifluoro-methane	[illegible]	ND	ND	ND
75-01-4	Vinyl Chloride	80	ND	ND	ND
75-00-3	Chloroethane	80	ND	ND	ND
75-09-2	Methylene Chloride	200	ND	ND	ND
75-69-4	Trichlorofluoro-methane	200	ND	ND	ND
75-35-4	1,1-Dichloroethene	40	ND	ND	ND
75-34-3	1,1-Dichloroethane	40	ND	ND	ND
156-60-5	Trans-1,2-Dichloro-ethene	40	ND	ND	ND
67-66-3	Chloroform	40	ND	ND	ND
107-06-2	1,2-Dichloroethane	40	ND	ND	ND
71-55-6	1,1,1-Trichloro-ethane	30	ND	ND	ND
56-23-5	Carbon Tetra-chloride	30	ND	ND	ND
75-27-4	Bromodichloro-methane	80	ND	ND	ND
78-87-5	1,2-Dichloro-propane	40	ND	ND	ND
10061-02-6	Trans-1,3-Dichloro-propene	200	ND	ND	ND
79-01-6	Trichloroethene	80	ND	ND	ND
124-48-1	Dibromochloro-methane	80	ND	ND	ND
79-00-5	1,1,2-Trichloro-ethane	200	ND	ND	ND
10061-01-5	cis-1,3-Dichloro-propene	200	ND	ND	ND
110-75-8	2-Chloroethyl-vinylether	200	ND	ND	ND
75-25-2	Bromoform	400	ND	ND	ND
79-34-5	1,1,2,2-Tetra-chloroethane	400	ND	ND	ND
127-18-4	Tetrachloroethene	80	ND	ND	ND
71-43-2	Benzene	40	ND	ND	ND
108-88-3	Toluene	40	ND	ND	ND

"Confirmation analyses MDLs are the same as the 8010/8020 MDL's"

	AFP 59 SW-2 24'-26' Hart 010	AFP 59 SW-3 22'-24' Hart 009	AFP 59 SW-3 24'-26' Hart 010

PRINCETON TESTING LABORATORY
SAMPLE ANALYSIS REPORT

For Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Report Date 10/23/86

Job No. [illegible]
Date Received: [illegible]
Units: [illegible]

Hart sample nos. at bottom of page

TEST PERFORMED: Vol. Halocarbons & Aromatics, Non-Aq. - [illegible]

COMPOUND		DET LMTS	004	005	006
108-90-7	Chlorobenzene	40	ND	ND	ND
100-41-4	Ethylbenzene	40	ND	ND	ND
541-73-1	1,3-Dichloro-benzene	40	ND	ND	ND
95-50-1	1,2-Dichloro-benzene	40	ND	ND	ND
106-46-7	1,4-Dichloro-benzene	40	ND	ND	ND

	AFP 59 SW-2 24'-26' Hart 010	AFP 59 SW-3 22'-24' Hart 009	AFP 59 SW-3 24'-26' Hart 010
SURROGATE RECOVERY DATA % RECOVERY			
Bromochloromethane			
4-Bromofluorobenzene			
DATE RECEIVED:	9/15/86	9/15/86	9/15/86
DATE ANALYZED:	9/19/86	9/19/86	9/19/86
MDL MULTIPLIER:	.	.	
SPIKE COMPOUNDS, % RECOVERY			
Vinyl Chloride	N/A	N/A	N/A
1,1-Dichloroethene	N/A	N/A	N/A
1,2-Dichloroethane	N/A	N/A	N/A
Trichloroethene	N/A	N/A	N/A
1,1,1-Trichloroethane	N/A	N/A	N/A
Benzene	N/A	N/A	N/A
1,4-Dichlorobenzene	N/A	N/A	N/A
Carbon Tetrachloride	N/A	N/A	N/A

'Confirmation analyses MDLs are the same as the 8010/8020 MDL's'

PRINCETON TESTING LABORATORY

SAMPLE ANALYSIS REPORT

For: Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Report Date: 10/23/86

Job No.: [illegible]
Date Received: [illegible]
Units: UG/KG

Hart sample no. at bottom of page

TEST PERFORMED: Vol. Halocarbons & Aromatics, Non-Aq. - 8010/8020

	COMPOUND	DET LMTS	[illegible]
74-87-3	Chloromethane	800	ND
74-83-9	Bromomethane	400	ND
75-71-8	Dichlorodifluoro-methane	200	ND
75-01-4	Vinyl Chloride	80	ND
75-00-3	Chloroethane	80	ND
75-09-2	Methylene Chloride	200	ND
75-69-4	Trichlorofluoro-methane	200	ND
75-35-4	1,1-Dichloroethene	40	ND
75-34-3	1,1-Dichloroethane	40	ND
156-60-5	Trans-1,2-Dichlo-oethene	40	ND
67-66-3	Chloroform	40	ND
107-06-2	1,2-Dichloroethane	40	ND
71-55-6	1,1,1-Trichloro-ethane	80	ND
56-23-5	Carbon Tetra-chloride	80	ND
75-27-4	Bromodichlor-methane	80	ND
78-87-5	1,2-Dichloro-propane	40	ND
10061-02-6	Trans-1,3-Dichlor-opropene	200	ND
79-01-6	Trichloroethene	80	ND
124-48-1	Dibromochloro-methane	80	ND
79-00-5	1,1,2-Trichloro-ethane	200	ND
10061-01-5	cis-1,3-Dichloro-propene	200	ND
100-75-8	2-Chloroethyl-vinylether	200	ND
75-25-2	Bromoform	400	ND
79-34-5	1,1,2,2-Tetra-chloroethane	400	ND
127-18-4	Tetrachloroethene	80	ND
71-43-2	Benzene	40	ND
108-88-3	Toluene	40	ND

"Confirmation analyses MDLs are the same as the 8010/8020 MDL's"

AFP 59
SW-4
22'-24'
Hart 001

PRINCETON TESTING LABORATORY
SAMPLE ANALYSIS REPORT

For: Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Report Date: 10/23/86

Job No.: 86GW2873
Date Received: 09/15/86
Units: UG/KG

Hart sample no. at bottom of page

TEST PERFORMED: Vol. Halocarbons & Aromatics, Non-Aq. - 8010/8020

	COMPOUND	DET LMTS	001
108-90-7	Chlorobenzene	40	ND
100-41-4	Ethylbenzene	40	ND
541-73-1	1,3-Dichloro-benzene	40	ND
95-50-1	1,2-Dichloro-benzene	40	ND
106-46-7	1,4-Dichloro-benzene	40	ND

SURROGATE RECOVERY DATA
% RECOVERY

AFP 59
SW-4
22'-24'
Hart 001

Bromochloromethane
4-Bromofluorobenzene

DATE RECEIVED: 9/15/86

DATE ANALYZED: 9/19/86

MDL MULTIPLIER: 1

SPIKE COMPOUNDS
% RECOVERY

Vinyl Chloride	N/A
1,1-Dichloroethene	N/A
1,2-Dichloroethane	N/A
Trichloroethene	N/A
1,1,1-Trichloroethane	N/A
Benzene	N/A
1,4-Dichlorobenzene	N/A
Carbon Tetrachloride	N/A

Confirmation analyses MDLs are the same as the 8010/8020 MDL's

PRINCETON TESTING LABORATORY

SAMPLE ANALYSIS REPORT

For: Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Report Date: 10/23/86

Job No.: [illegible]
Date Received: [illegible]
Units: UG/KG

Hart sample nos. at bottom of page

TEST PERFORMED: Volatile Halocarbons & Aromatics, Ac. EPA 601/602

	COMPOUND	DET LMTS	FIELD BLK1	FIELD BLK2
74-87-3	Chloromethane	10	ND	ND
74-83-9	Bromomethane	10	ND	ND
75-71-8	Dichlorodifluoro-methane	5	ND	ND
75-01-4	Vinyl Chloride	2	ND	ND
75-00-3	Chloroethane	2	ND	ND
75-09-2	Methylene Chloride	5	ND	ND
75-69-4	Trichlorofluoro-methane	5	ND	ND
75-35-4	1,1-Dichloroethene	1	ND	ND
75-34-3	1,1-Dichloroethane	1	ND	ND
156-60-5	Trans-1,2-Dichlor-oethene	1	ND	ND
67-66-3	Chloroform	2	ND	ND
107-06-2	1,2-Dichloroethane	1	ND	ND
71-55-6	1,1,1-Trichloro-ethane	2	ND	ND
56-23-5	Carbon Tetra-chloride	2	ND	ND
75-27-4	Bromodichloro-methane	2	ND	ND
78-87-5	1,2-Dichloro-propane	1	ND	ND
10061-02-6	Trans-1,3-Dichlor-opropene	5	ND	ND
79-01-6	Trichloroethene	2	ND	ND
124-48-1	Dibromochloro-methane	2	ND	ND
79-00-5	1,1,2-Trichloro-ethane	5	ND	ND
10061-01-5	cis-1,3-Dichloro-propene	5	ND	ND
100-75-8	2-Chloroethyl-vinylether	5	ND	ND
75-25-2	Bromoform	10	ND	ND
79-34-5	1,1,2,2-Tetra-chloroethane	10	ND	ND
127-18-4	Tetrachloroethylene	2	ND	ND
71-43-2	Benzene	~~2~~ 1	ND	ND
108-88-3	Toluene	~~2~~ 1	ND	ND

KS/JD

"Confirmation analyses MDLs are the same as the 8010/8020 MDL's"

	AFP 59 Field Blank Water Hart 001	AFP 59 Field Blank Water Hart 001

PRINCETON TESTING LABORATORY
SAMPLE ANALYSIS REPORT

For Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Report Date: 10/23/86
Job No.: 35GW2373
Date Received: 09/[illegible]/86
Units: UG/KG

Hart sample nos. at bottom of page

TEST PERFORMED: Volatile Halocarbons & Aromatics - EPA 601/602

COMPOUND		DET LMTS	FIELD BLK1	FIELD BLK2
108-90-7	Chlorobenzene	<1	ND	ND
100-41-4	Ethyl benzene	<1	ND	ND
541-73-1	1,3-Dichloro-benzene	<1	ND	ND
95-50-1	1,2-Dichloro-benzene	<1	ND	ND
106-46-7	1,4-Dichloro-benzene	<1	ND	ND

KS/JD

	AFP 59 Field Blank Water Hart 001	AFP 59 Field Blank Water Hart 001
SURROGATE RECOVERY DATA % RECOVERY		
Bromochloromethane		
4-Bromofluorobenzene		
DATE RECEIVED:		
DATE ANALYZED:	9/19/86	9/19/86
MDL MULTIPLIER:		
SPIKE COMPOUNDS % RECOVERY		
Vinyl Chloride	N/A	N/A
1,1-Dichloroethene	N/A	N/A
1,2-Dichloroethane	N/A	N/A
Trichloroethene	N/A	N/A
1,1,1-Trichloroethane	N/A	N/A
Benzene	N/A	N/A
1,4-Dichlorobenzene	N/A	N/A
Carbon Tetrachloride	N/A	N/A

"Confirmation analyses MDLs are the same as the 8010/8020 MDL's"

James E. Dennison

James E. Dennison Ph.D., CIH
Vice President and Technical Director

353W2373 Fred C. Hart Associates

S A M P L E N U M B E R S

DTL #	Customer #	DTL #	Customer #
001	SW-1 (18-20)	006	SW-3 (24-26)
002	SW-1 (24-26)	007	SW-4 (22-24)
003	SW-2 (22-24)		
004	SW-2 (24-26)		
005	SW-3 (22-24)		

PRINCETON TESTING LABORATORY

SAMPLE ANALYSIS REPORT

For: Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Report Date: 10/23/86
Job No.: [illegible]
Date Received: [illegible]
Units: ug/L

Hart sample nos. at bottom of page

TEST PERFORMED: Volatile Halocarbons & Aromatics, [illegible] EPA 601/602

	COMPOUND	DET LMTS	001	002	003
74-87-3	Chloromethane	20	ND	ND	ND
74-83-9	Bromomethane	[illegible]	ND	ND	ND
75-71-8	Dichlorodifluoro-methane	5	ND	ND	[illegible]
75-01-4	Vinyl Chloride	[illegible]	ND	ND	ND
75-00-3	Chloroethane	2	ND	ND	ND
75-09-2	Methylene Chloride	1	ND	ND	ND
75-69-4	Trichlorofluoro-methane	5	ND	ND	ND
75-35-4	1,1-Dichloroethene	1	ND	ND	ND
75-34-3	1,1-Dichloroethane	1	ND	ND	ND
156-60-5	Trans-1,2-Dichloro-oethene	1	ND	ND	ND
67-66-3	Chloroform	2	ND	ND	ND
107-06-2	1,2-Dichloroethane	1	ND	ND	ND
71-55-6	1,1,1-Trichloro-ethane	2	ND	ND	ND
56-23-5	Carbon Tetra-chloride	2	ND	ND	ND
75-27-4	Bromodichloro-methane	2	ND	ND	ND
78-87-5	1,2-Dichloro-propane	[illegible]	ND	ND	ND
10061-02-6	Trans-1,3-Dichloro-opropene	5	ND	ND	ND
79-01-6	Trichloroethene	2	ND	ND	5
124-48-1	Dibromochloro-methane	2	ND	ND	ND
79-00-5	1,1,2-Trichloro-ethane	0.5	ND	ND	ND
10061-01-5	cis-1,3-Dichloro-propene	5	ND	ND	ND
100-75-8	2-Chloroethyl-vinylether	5	ND	ND	ND
75-25-2	Bromoform	10	ND	ND	ND
79-34-5	1,1,2,2-Tetra-chloroethane	0.18	ND	ND	ND
127-18-4	Tetrachloroethylene	2	ND	ND	ND
71-43-2	Benzene	~~2~~ 1	ND	ND	ND
108-88-3	Toluene	~~2~~ 1	ND	ND	ND

KS/JD

"Confirmation analyses MDLs are the same as the 601/602 MDLs"

	AFP 59	AFP 59	AFP 59
	SW-1	SW-2	SW-3
	Water	Water	Water
	Hart 001	Hart 002	Hart 003

PRINCETON TESTING LABORATORY

SAMPLE ANALYSIS REPORT

For: Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Report Date: 10/23/86

Job No.: 863W2970
Date Received: 09/24/86
Units: ug/L

Hart sample nos. at bottom of page

TEST PERFORMED: Volatile Halocarbons & Aromatics - EPA 601/602

COMPOUND		DET LMTS	001	002	003
108-90-7	Chlorobenzene	2 1	ND	ND	ND
100-41-4	Ethyl benzene	2 1	ND	ND	ND
541-73-1	1,3-Dichloro-benzene	2 1	ND	ND	ND
95-50-1	1,2-Dichloro-benzene	2 1	ND	ND	ND
106-46-7	1,4-Dichloro-benzene	2 1	ND	ND	ND
		KS/JD			
SURROGATE RECOVERY DATA % RECOVERY			AFP 59 SW-1 Water Hart 001	AFP 59 SW-2 Water Hart 002	AFP 59 SW-3 Water Hart 003
Bromochloromethane					
4-Bromofluorobenzene					
DATE RECEIVED:			9/24/86	9/24/86	9/24/86
DATE ANALYZED:			10/3/86	10/3/86	10/3/86
MDL MULTIPLIER:			1	1	1
SPIKE COMPOUNDS % RECOVERY					
Vinyl Chloride			N/A	N/A	N/A
1,1-Dichloroethene			N/A	N/A	N/A
1,2-Dichloroethane			N/A	N/A	N/A
Trichloroethene			N/A	N/A	N/A
1,1,1-Trichloroethane			N/A	N/A	N/A
Benzene			N/A	N/A	N/A
1,4-Dichlorobenzene			N/A	N/A	N/A
Carbon Tetrachloride			N/A	N/A	N/A

'Confirmation analyses MDLs are the same as the 601/602 MDLs'

PRINCETON TESTING LABORATORY

SAMPLE ANALYSIS REPORT

For Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Report Date 10/23/86

Job No.: 86GW2870
Date Received: [illegible]
Units: UG/L

Hart sample nos. at bottom of page

TEST PERFORMED: Volatile Halocarbons & Aromatics, Acc. EPA 601/602

	COMPOUND	DET LMTS	004	005	FIELD BLK
74-87-3	Chloromethane	20	ND	ND	ND
74-83-9	Bromomethane	10	ND	ND	ND
75-71-8	Dichlorodifluoro-methane	5	ND	ND	ND
75-01-4	Vinyl Chloride	1	ND	ND	ND
75-00-3	Chloroethane	2	ND	ND	ND
75-09-2	Methylene Chloride	1	ND	ND	ND
75-69-4	Trichlorofluoro-methane	5	ND	ND	ND
75-35-4	1,1-Dichloroethene	1	ND	ND	ND
75-34-3	1,1-Dichloroethane	1	ND	15	ND
156-60-5	Trans-1,2-Dichloro-ethene	1	ND	66	ND
67-66-3	Chloroform	2	ND	ND	ND
107-06-2	1,2-Dichloroethane	1	ND	ND	ND
71-55-6	1,1,1-Trichloro-ethane	2	ND	9	ND
56-23-5	Carbon Tetra-chloride	2	ND	ND	ND
75-27-4	Bromodichloro-methane	2	ND	ND	ND
78-87-5	1,2-Dichloro-propane	1	ND	ND	ND
10061-02-6	Trans-1,3-Dichlor-propene	5	ND	ND	ND
79-01-6	Trichloroethene	2	ND	11	ND
124-48-1	Dibromochloro-methane	2	ND	ND	ND
79-00-5	1,1,2-Trichloro-ethane	0.5	ND	ND	ND
10061-01-5	cis-1,3-Dichloro-propene	5	ND	ND	ND
110-75-8	2-Chloroethyl-vinylether	5	ND	ND	ND
75-25-2	Bromoform	10	ND	ND	ND
79-34-5	1,1,2,2-Tetra-chloroethane	0.18	ND	ND	ND
127-18-4	Tetrachloroethylene	2	ND	ND	ND
71-43-2	Benzene	~~2~~ 1	ND	ND	ND
108-88-3	Toluene	~~2~~ 1	ND	ND	ND

KS/JD

"Confirmation analyses MDLs are the same as the 601/602 MDLs"

AFP 59 SW-4 Water Hart 004	AFP 59 Production Well Water Hart 007	AFP 59 Field Blank Water Hart 005

PRINCETON TESTING LABORATORY
SAMPLE ANALYSIS REPORT

For: Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Hart sample nos. at bottom of page

Report Date: 10/23/86
Job No.: 86GW297[illegible]
Date Received: 09/24/86
Units: UG/L

TEST PERFORMED: Volatile Halocarbons & Aromatics - EPA 601/602

	COMPOUND	DET LMTS	004	005	FIELD BLK
108-90-7	Chlorobenzene	~~2~~ 1	ND	ND	ND
100-41-4	Ethylbenzene	~~2~~ 1	ND	ND	ND
541-73-1	1,3-Dichloro-benzene	~~2~~ 1	ND	ND	ND
95-50-1	1,2-Dichloro-benzene	~~2~~ 1	ND	ND	ND
106-46-7	1,4-Dichloro-benzene	~~2~~ 1	ND	ND	ND

KS/JD

	AFP 59 SW-4 Water Hart 004	AFP 59 Production Well Water Hart 007	AFP 59 Field Blank Water Hart 005
SURROGATE RECOVERY DATA % RECOVERY			
Bromochloromethane			
4-Bromofluorobenzene			
DATE RECEIVED:	9/24/86	9/24/86	9/24/86
DATE ANALYZED:	10/3/86	10/3/86	10/3/86
MDL MULTIPLIER:			
SPIKE COMPOUNDS % RECOVERY			
Vinyl Chloride	N/A	N/A	N/A
1,1-Dichloroethene	N/A	N/A	N/A
1,2-Dichloroethane	N/A	N/A	N/A
Trichloroethene	N/A	N/A	N/A
1,1,1-Trichloroethane	N/A	N/A	N/A
Benzene	N/A	N/A	N/A
1,4-Dichlorobenzene	N/A	N/A	N/A
Carbon Tetrachloride	N/A	N/A	N/A

"Confirmation analyses MDLs are the same as the 601/602 MDLs"

85GW2970 Fred C. Hart Associates

SAMPLE NUMBERS

PTL #	Customer #	PTL #	Customer #
001	AFP-59 SW-1	005	AFP-59 PRODUCTION WELL
002	AFP-59 SW-2		
003	AFP-59 SW-3		
004	AFP-59 SW-4		

H.3-15

Princeton Service Center
U.S. Route 1
609-452-9050
TLX 84-3492

princeton testing laboratory

Member

P.O. Box 3108, Princeton, N.J. 08540

FRED C. HART ASSOCIATES
530 FIFTH AVENUE
NEW YORK, NY 10036

Attn: Robert Goldman

October 23, 1986

Job 86GW2970
PO 01071-00-86007-00
(JOHNSON CITY)

AFP 59
SW-3
Water
Hart 003
METHOD: EPA 601/602 (SW-3)
DATE SAMPLED: 9/23/86

METHOD: EPA 624 (CONFIRMATORY ANALYSIS)
Micrograms/liter

DATE RUN	(SW-3) 10/3/86	10/4/86 (CONFIRM.)
Chloromethane	ND	ND
Bromomethane	ND	ND
Dichlorodifluoromethane	ND	ND
Vinyl Chloride	ND	ND
Chloroethane	ND	ND
Methylene Chloride	ND	ND
Trichlorofluoromethane	ND	ND
1,1-dichloroethene	ND	ND
1,1-dichloroethane	ND	ND
trans-1,2-dichloroethene	ND	ND
Chloroform	ND	ND
1,2-dichloroethane	ND	ND
1,1,1-trichloroethane	ND	ND
Carbon Tetrachloride	ND	ND
Bromodichloromethane	ND	ND
1,2-dichloropropane	ND	ND
trans-1,3-dichloropropene	ND	ND
Trichloroethene	6	2
Dibromochloromethane	ND	ND
1,1,2-trichloroethane	ND	ND
cis-1,3-dichloropropene	ND	ND
2-chloroethylvinylether	ND	ND
Bromoform	ND	ND
1,1,2,2-tetrachloroethane	ND	ND
Tetrachloroethene	ND	ND
Benzene	ND	ND
Toluene	ND	ND
Chlorobenzene	ND	ND
Ethylbenzene	ND	ND
1,3-dichlorobenzene	ND	ND
1,2-dichlorobenzene	ND	ND
1,4-dichlorobenzene	ND	ND

ND = Not Detected

Nancy S. Dunn, Manager
Organic Laboratory

rk

H.3-16

Princeton Service Center
U.S. Route 1
609-452-9050
TLX 84-3492

princeton testing laboratory

Member

P.O. Box 3108, Princeton, N.J. 08540

FRED C. HART ASSOCIATES
530 FIFTH AVNEUE
NEW YORK, NY 10036

Attn: Robert Goldman

October 22, 1986

JOB 86GW2970
PO 01071-00-86007-00
(JOHNSON CITY)

AFP 59 Production Well Water Hart 007	METHOD 601/602 AFP 59 - PRODUCTION WELL SAMPLED: 9/23/86 ANALYZED: 10/3/86	METHOD 624 CONFIRMATORY ANALYSIS 10/4/86
	Micrograms/liter	(See attached sheet for MDL)
Chloromethane	ND	ND
Bromomethane	ND	ND
Dichlorodifluoromethane	ND	ND
Vinyl Chloride	ND	ND
Chloroethane	ND	ND
Methylene Chloride	ND	ND
Trichlorofluoromethane	ND	ND
1,1-dichloroethene	ND	ND
1,1-dichloroethane	16	15
trans-1,2-dichloroethene	66	73
Chloroform	ND	ND
1,2-dichloroethane	ND	ND
1,1,1-trichloroethane	9	3
Carbon Tetrachloride	ND	ND
Bromodichloromethane	ND	ND
1,2-dichloropropane	ND	ND
trans-1,3-dichloropropene	ND	ND
Trichloroethene	11	8
Dibromochloromethane	ND	ND
1,1,2-trichloroethane	ND	ND
cis-1,3-dichloropropene	ND	ND
2-chloroethylvinylether	ND	ND
Bromoform	ND	ND
1,1,2,2-tetrachloroethane	ND	ND
Tetrachloroethene	ND	ND
Benzene	ND	ND
Toluene	ND	ND
Chlorobenzene	ND	ND
Ethylbenzene	ND	ND
1,3-dichlorobenzene	ND	ND
1,2-dichlorobenzene	ND	ND
1,4-dichlorobenzene	ND	ND

ND = Not Detected

rk

Nancy S. Dunn, Manager
Organic Laboratory

APPENDIX H.4

PTL ORGANIC ANALYTICAL QA/QC RESULTS

(CL5121A)

PRINCETON TESTING LABORATORY

SAMPLE ANALYSIS REPORT

For: Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Report Date: 10/23/86
Sample No.: BLANK
Job Number: 86GA[illegible]

Test Performed: Volatile Halocarbons & Aromatics, Acc. EPA 601/602

DATA		DET LIMIT	RESULTS
74-87-3	Chloromethane	20	ND
74-83-9	Bromomethane	10	ND
75-71-8	Dichlorodifluoro-methane	5	ND
75-01-4	Vinyl Chloride	2	ND
75-00-3	Chloroethane	2	ND
75-09-2	Methylene Chloride	5	ND
75-69-4	Trichlorofluoro-methane	5	ND
75-35-4	1,1-Dichloroethene		ND
75-34-3	1,1-Dichloroethane	1	ND
156-60-5	Trans-1,2-Dichlor-oethene	1	ND
67-66-3	Chloroform	2	ND
107-06-2	1,2-Dichloroethane	1	ND
71-55-6	1,1,1-Trichloro-ethane	2	ND
56-23-5	Carbon Tetra-chloride	2	ND
75-27-4	Bromodichloro-methane	2	ND
78-87-5	1,2-Dichloro-propane	1	ND
10061-02-6	Trans-1,3-Dichlor-opropene	5	ND
79-01-6	Trichloroethene	2	ND
124-48-1	Dibromochloro-methane	2	ND
79-00-5	1,1,2-Trichloro-ethane	5	ND
10061-01-5	cis-1,3-Dichloro-propene	5	ND
100-75-8	2-Chloroethyl-vinylether	5	ND
75-25-2	Bromoform	10	ND
79-34-5	1,1,2,2-Tetra-chloroethane	10	ND
127-18-4	Tetrachloroethylene	2	ND
71-43-2	Benzene	2	ND
108-88-3	Toluene	2	ND

'Confirmation analyses MDLs are the same as the 8010/8020 MDL's'

PRINCETON TESTING LABORATORY

SAMPLE ANALYSIS REPORT

For:	Fred C. Hart Associates	Report Date:	10/23/86
	530 Fifth Avenue		
	New York, NY 10036	Sample No.:	BLANK
		Job Number:	86GW28[illegible]

Test Performed: Volatile Halocarbons & Aromatics - EPA 601/602

DATA		DET LIMIT	RESULTS
108-90-7	Chlorobenzene	2	ND
100-41-4	Ethylbenzene	2	ND
541-73-[illegible]	1,3-Dichlorobenzene	2	ND
95-50-[illegible]	1,2-Dichlorobenzene	2	ND
106-46-7	1,4-Dichlorobenzene	2	ND

...

...

SURROGATE RECOVERY DATA
% RECOVERY

...

Bromochloromethane	99
4-Bromofluorobenzene	92

...

...

DATE RECEIVED:

...

DATE ANALYZED: 9/9/86

...

MDL MULTIPLIER: .

...

SPIKE COMPOUNDS
% RECOVERY

.

Vinyl Chloride	N/A
1,1-Dichloroethene	N/A
1,2-Dichloroethane	N/A
Trichloroethene	N/A
1,1,1-Trichloroethane	N/A
Benzene	N/A
1,4-Dichlorobenzene	N/A
Carbon Tetrachloride	N/A

"Confirmation analyses MDLs are the same as the 8010/8020 MDL's"

James E. Dennison

James E. Dennison Ph.D., CIH
Vice President and Technical Director

princeton testing laboratory
U.S. Route 1
Princeton Service Center
(609) 452-9050
P.O. Box 3108, Princeton, N.J. 08540

QUALITY CONTROL REPORT

Duplicate Analysis

JOB NO. 86GW2873
ANALYST: Peter Reynolds
DATE: 9-9-86
MATRIX: Aqueous
METHOD: EPA 601,602

COMPOUND	Micrograms/Liter	CONCENTRATION (Ug/L)		Relative Percent Difference (RPD)*
Sample ID	COMPOUND NAME	Run 1 (D_1)	Run 2 (D_2)	
	Vinyl Chloride	30.95	28.76	7.0
	1,1-Dichloroethene	24.71	24.80	0.3
	Trans 1,2-Dichloroethene	24.85	24.84	0.1
	Carbon tetrachloride	24.87	24.84	0.1
	Bromoform	24.10	23.84	1.0
	Benzene	24.47	25.09	2.5
	Ethyl Benzene	24.66	25.23	2.3
	1,2-Dichlorobenzene	25.34	25.45	0.4

$$*RPD = \frac{(D_1 - D_2)}{\left[(D_1 + D_2)/_2\right]} \times 100$$

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QUALITY CONTROL REPORT

Matrix Spike Analysis

JOB NO. 86GW2987
ANALYST: Peter Reynolds
DATE: 9-9-86
MATRIX: Aqueous
METHOD: EPA 601, 602

COMPOUND		Micrograms/Liter			%
Sample ID	COMPOUND NAME	Sample Result (SR)	Spiked Sample Result (SSR)	Spike Added (SA)	Recovery*
2873 Spike	Vinyl Chloride	ND	30.95	25	124
	1,1-Dichloroethene	ND	24.71	25	99
	Trans-1,2-Dichloroethene	ND	24.85	25	99
	Carbon tetrachloride	ND	24.87	25	99
	Bromoform	ND	24.10	25	96
	Benzene	ND	24.47	25	98
	Ethyl Bezene	ND	24.66	25	99
	1,2-Dichlorobenzene	ND	25.34	25	101

$$*\% \text{ Recovery} = \frac{(SSR - SR)}{(SA)} \times 100$$

PRINCETON TESTING LABORATORY

SAMPLE ANALYSIS REPORT

For: Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Report Date: 10/23/86
Sample No.: BLANK
Job Number: 863A0970

Test Performed: Volatile Halocarbons & Aromatics, Aq. EPA 601/602

DATA		DET LIMIT	RESULTS
74-87-3	Chloromethane	20	ND
74-83-9	Bromomethane	10	ND
75-71-8	Dichlorodifluoromethane	5	ND
75-01-4	Vinyl Chloride	2	ND
75-00-3	Chloroethane	2	ND
75-09-2	Methylene Chloride	5	ND
75-69-4	Trichlorofluoromethane	5	ND
75-35-4	1,1-Dichloroethene	1	ND
75-34-3	1,1-Dichloroethane	1	ND
156-60-5	Trans-1,2-Dichloroethene	1	ND
67-66-3	Chloroform	2	ND
107-06-2	1,2-Dichloroethane	1	ND
71-55-6	1,1,1-Trichloroethane	2	ND
56-23-5	Carbon Tetrachloride	2	ND
75-27-4	Bromodichloromethane	2	ND
78-87-5	1,2-Dichloropropane	1	ND
10061-02-6	Trans-1,3-Dichloropropene	5	ND
79-01-6	Trichloroethene	2	ND
124-48-1	Dibromochloromethane	2	ND
79-00-5	1,1,2-Trichloroethane	5	ND
10061-01-5	cis-1,3-Dichloropropene	5	ND
100-75-8	2-Chloroethylvinylether	5	ND
75-25-2	Bromoform	10	ND
79-34-5	1,1,2,2-Tetrachloroethane	10	ND
127-18-4	Tetrachloroethylene	2	ND
71-43-2	Benzene	2	ND
108-88-3	Toluene	2	ND

"Confirmation analyses MDLs are the same as the 601/602 MDLs"

PRINCETON TESTING LABORATORY
SAMPLE ANALYSIS REPORT

For: Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Report Date: 10/23/86

Sample No.: BLANK
Job Number: 863W2970

Test Performed: Volatile Halocarbons & Aromatics - EPA 601/602

DATA		DET LIMIT	RESULTS
108-90-7	Chlorobenzene	2	ND
100-41-4	Ethylbenzene	2	ND
541-73-1	1,3-Dichloro-benzene	2	ND
95-50-1	1,2-Dichloro-benzene	2	ND
106-46-7	1,4-Dichloro-benzene	2	ND

...
...

SURROGATE RECOVERY DATA
% RECOVERY

...

Bromochloromethane	100
4-Bromofluorobenzene	99

...
...

DATE RECEIVED:

...

DATE ANALYZED: 10/13/86

...

MDL MULTIPLIER: 1

...

SPIKE COMPOUNDS
% RECOVERY

Vinyl Chloride	N/A
1,1-Dichloroethene	N/A
1,2-Dichloroethane	N/A
Trichloroethene	N/A
1,1,1-Trichloroethane	N/A
Benzene	N/A
1,4-Dichlorobenzene	N/A
Carbon Tetrachloride	N/A

"Confirmation analyses MDLs are the same as the 601/602 MDLs"

James E. Dennison

James E. Dennison Ph.D., CIH
Vice President and Technical Director

princeton testing laboratory

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QUALITY CONTROL REPORT

Matrix Spike Analysis

JOB NO. 86GW2970
ANALYST: Peter Reynolds
DATE: 10/13/86
MATRIX: Aqueous
METHOD: EPA 601, 602

COMPOUND Sample ID	COMPOUND NAME	Sample Result (SR)	Spiked Sample Result (SSR)	Spike Added (SA)	% Recovery*
2970 Spike	Vinyl chloride	ND	31.08	25.0	124
	1,1-Dichloroethene	ND	21.66	25.0	87
	Trans-1,2-Dichloroethene	ND	22.45	25.0	90
	Carbon tetrachloride	ND	22.46	25.0	90
	Bromoform	ND	20.42	25.0	82
	Benzene	ND	16.70	25.0	67
	Ethyl denzene	ND	17.23	25.0	69
	1,2-Dichlorobenzene	ND	17.24	25.0	70

*% Recovery = $\frac{(SSR - SR)}{(SA)} \times 100$

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QUALITY CONTROL REPORT
Duplicate Analysis

JOB NO. 86GW2970
ANALYST: Peter Reynolds
DATE: 10/13/86
MATRIX: Aqueous
METHOD: EPA 601/602

COMPOUND		CONCENTRATION (ug/l)		Relative Percent Difference (RPD)*
Sample ID	COMPOUND NAME	Run 1 (D_1)	Run 2 (D_2)	
2970 Spike	Vinyl chloride	31.08	34.51	10.5
Dup.				
	1,1-Dichloroethene	21.66	25.02	14.4
	Trans-1,2-Dichloroethene	22.45	25.02	10.8
	Carbon Tetrachloride	22.46	25.56	12.9
	Bromoform	20.42	22.23	8.4
	Benzene	16.70	24.67	37.4
	Ethyl Benzene	17.23	25.39	38.3
	1,2-Dichlorobenzene	17.24	26.98	44.1

$$*RPD = \frac{(D_1 - D_2)}{\left[(D_1 + D_2)/2\right]} \times 100$$

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QUALITY CONTROL REPORT

Surrogate Percent Recovery Summary

JOB NO. 86G02970

ANALYST: M.R. DAVE

DATE: 10/03/86

MATRIX: PE/mw

METHOD: EPA 601/602

COMPOUND	~~(Milligrams per Kilogram)~~ µg/l	CONCENTRATION ~~(Mg/Kg)~~ µg/l		% Recovery
Sample ID	SURROGATE NAME	Spiked Sample Result (SSR)	Spike Added (SA)	
SW-1	Bromochloromethane	328	340	96.5

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QUALITY CONTROL REPORT

Surrogate Percent Recovery Summary

JOB NO. 86GW2873
ANALYST: M.R. DAVE
DATE: 10/15/86
MATRIX: PE/mw
METHOD: EPA 601/602

COMPOUND ug/l ~~(Milligrams per Kilogram)~~		CONCENTRATION ug/l ~~(Mg/Kg)~~		% Recovery
Sample ID	SURROGATE NAME	Spiked Sample Result (SSR)	Spike Added (SA)	
AFP-59 SW-4	Bromochloromethane	336	340	98.8

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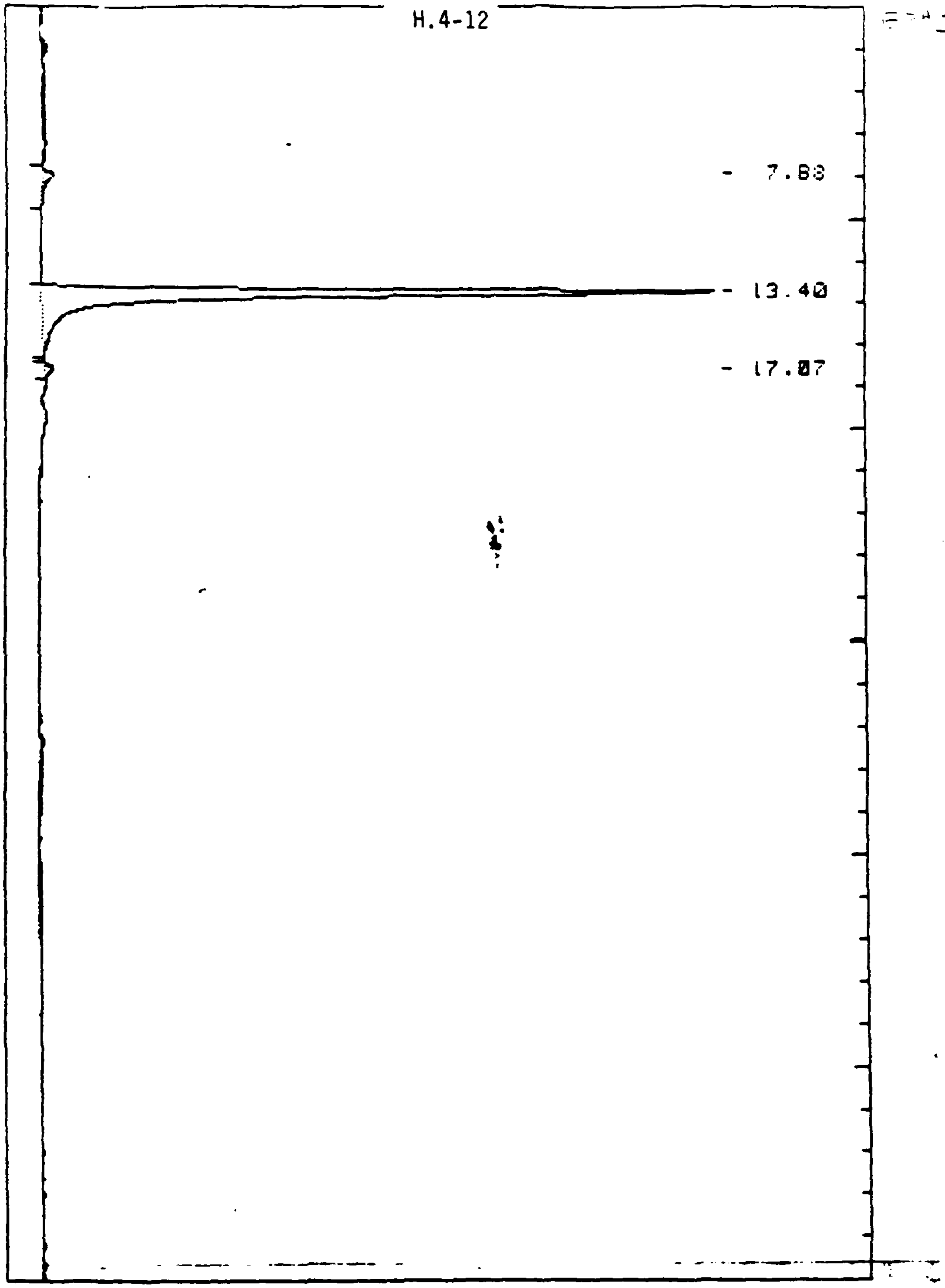
QUALITY CONTROL REPORT
Duplicate Analysis

JOB NO. 86GW2873
ANALYST: M R DAVE
DATE: 10/15/86
MATRIX: PE/mw
METHOD: EPA - 601/602

COMPOUND		CONCENTRATION (ug/1)		Relative Percent Difference (RPD)*
Sample ID	COMPOUND NAME	Run 1 (D_1)	Run 2 (D_2)	
AFP-59, SW-3 22'-24' HARTOCO	Methylene chloride	0	0	0
	1,1- Dichloroethane	0	0	0
	chloroform	0	0	0
	1,2- Dichloroethane	0	0	0

$$*RPD = \frac{(D_1 - D_2)}{\left[(D_1 + D_2)/2\right]} \times 100$$

Start time= 0.00 Stop time= 60.00 minutes
Lowest Value = 29.431 mV Highest Value = 121.371 mV Scale factor = 1



===

Sample Name SAMPLE# 86-2873 E.C.-Mast Soil SW-3 (250 ul) Deep

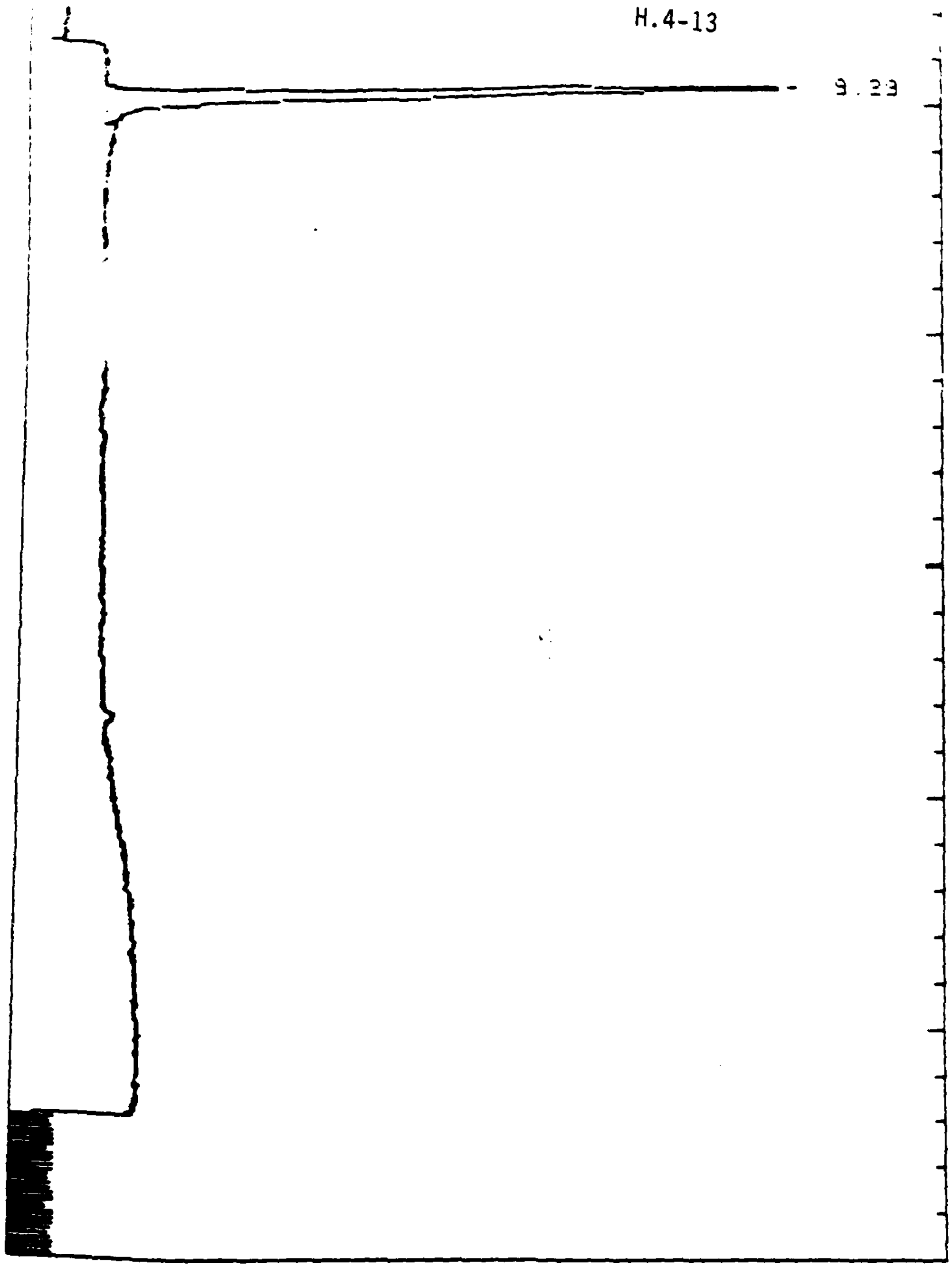
Date: 10/08/1986 15:01 Method: eXPERm Operator: MRD
Interface: 701 Cycle#: 4 Channel#: B Vial#: -1

===

Instrumental Parameters

Instrument: VARIAN3700
Column: 1%SP1000 Column Length: 2 Meters
Start Temp-Time (deg-min): 50 Ramp Hold (deg-min): 7
Program Rate (deg/min): 5 End Time-Temp (deg-min): 224

H.4-13

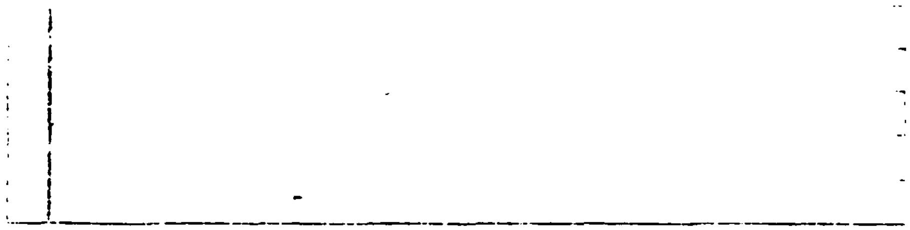


Sample Name SAMPLE# STD 25 μl + IS (1ml).

Date: 10/08/1986 18:03   Method: EXPERm   Operator: MRD
Interface: 701   Cycle#: 5   Channel#: A   Vial#: -1

Instrumental Parameters

Instrument: VARIAN3700
Column: 1%SP1000   Column Length: 2 Meters
Start Temp-Time (deg-min): 50   Ramp Hold (deg-min): 7
Program Rate (deg/min): 5   End Time-Temp (deg-min): 224
Prog Slope (# or Linear): L   Inj Port Temp: 200
He   Split Ratio:
Det 2-Type & Temp: FID,300



Sample Name SAMPLE#+IS-1ML - 86-2970 - F.C. Hq,t - Spl-Sw-3

Date: 10/03/1986 22:50 Method: eXPERm Operator: MPD
Interface: 701 Cycle#: 20 Channel#: 3 Vial#: -1

Instrumental Parameters

Instrument: VARIAN3700
Column: 1%SP1000 Column Length: 2 Meters
Start Temp-Time (deg-min): 50 Ramp Hold (deg-min): 7
Program Rate (deg/min): 5 End Time-Temp (deg-min): 224
Prog Slope (# or Linear): L Inj Port Temp: 200
Flowrate/Gas: 30ml/m He Split Ratio:
Det 1-Type & Temp: HALL,300 Det 2-Type & Temp: PID,300
Notes: EPA601/602 PRINCETON TESTING LABS

WARNING: File Already Exists, Raw Data Name Changed To J02RB117B
WARNING: File Already Exists, Raw Data Name Changed To J02RB117C
WARNING: File Already Exists, Raw Data Name Changed To J02RB117D

NOTE: The Data Was Stored In File J02RB117D:,707,0,1

*** AREA PERCENT REPORT ***

Data From Sample SAMPLE#+IS-1ML Collected on 10/03/1986 22:50
Delay Time : 0.00 min Run End : 60.00 min

Pk No.	Time [min]	Area [uV-sec]	Area %	B L	Ht [uV]	Normalized to Max Peak	Ar/Ht [sec]	A/D Range
1	7.971	182649	26.8580	2	844	40.337	216.3	Normal
2	9.410	452804	66.5834	2	11799	100.000	38.4	Normal
3	25.576	44602	6.5586	1	1702	9.850	26.2	Normal

Total Area = 680055 uV-sec Area Reject = 0 uV-sec
Sampling Rate = 1.00 pts/sec Bunch Factor = 3 pts
Noise Threshold = 2 uV Area Threshold = 1000 uV-sec

***************** EXTERNAL STANDARD REPORT ****************************
Data From Sample SAMPLE#+IS-1ML Collected on 10/03/1986 22:50
Delay Time : 0.00 Run Time : 60.00
Area Reject = 0 uV Sampling Rate = 1.00 pts/sec
Bunch Factor = 3 pts
Noise Threshold = 2 uV Area Threshold = 1000 uV-sec
Sample Amount = 1 ug/l Injection Vol = 1
Dilution Factor = 1 Multiplier Amount = 1.0000

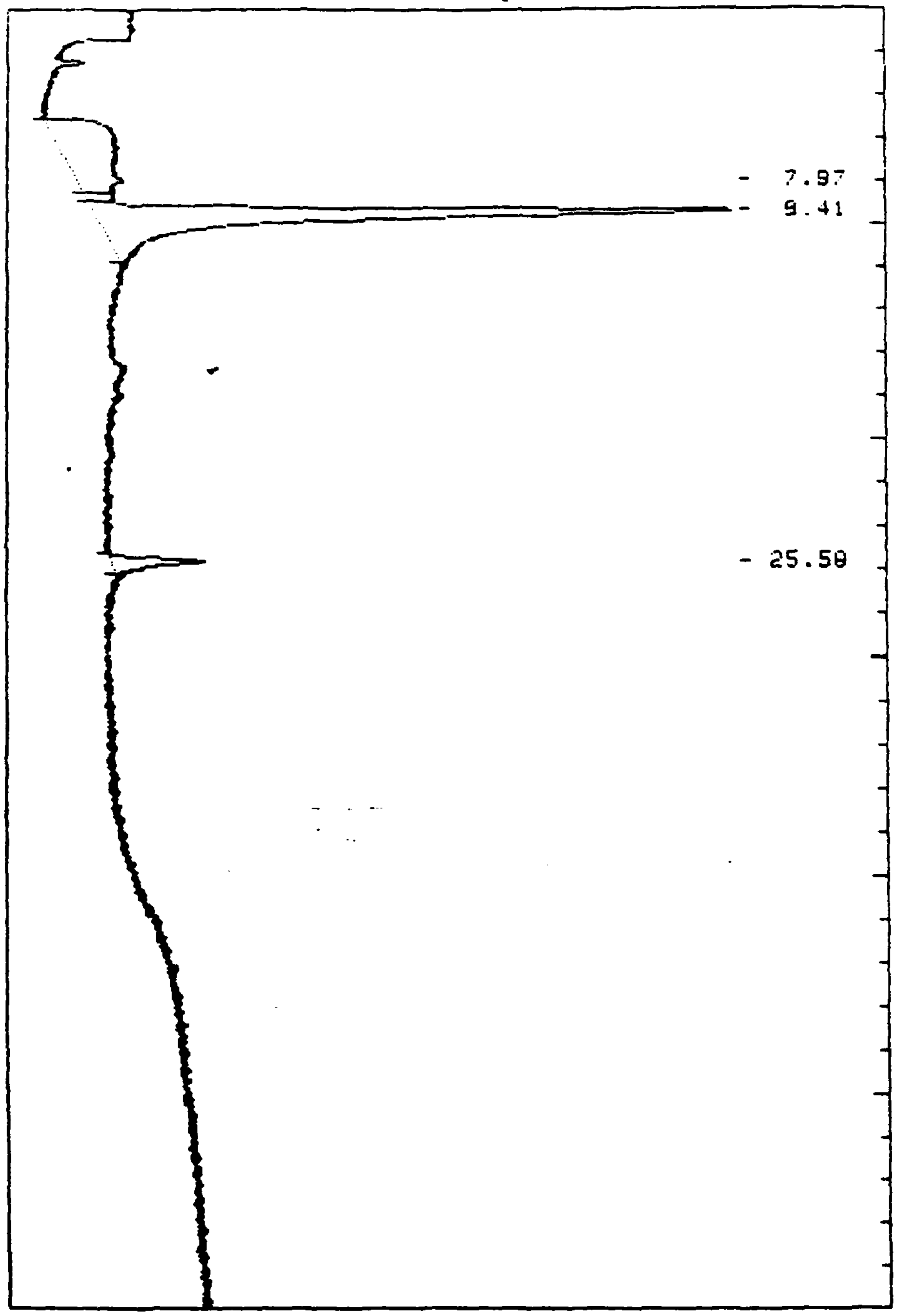
Peak Ret Peak Concentration as A/D Peak Ref % Delta

ug/L

3 25.59 BENZENE	2.37862	44602	1702	Normal	1	0	0	.5494.00

Total Amount = 2.37862

WARNING: File Already Exists, Area File Name Changed To J02RB117b
WARNING: File Already Exists, Area File Name Changed To J02RB117c
WARNING: File Already Exists, Area File Name Changed To J02RB117d
NOTE: Areas, Times, and Heights Stored in J02RB117d:,707,0,1
Start time= 0.00 Stop time= 60.00 minutes
Lowest Value = 5.806 mV Highest Value = 19.241 mV Scale factor = 1

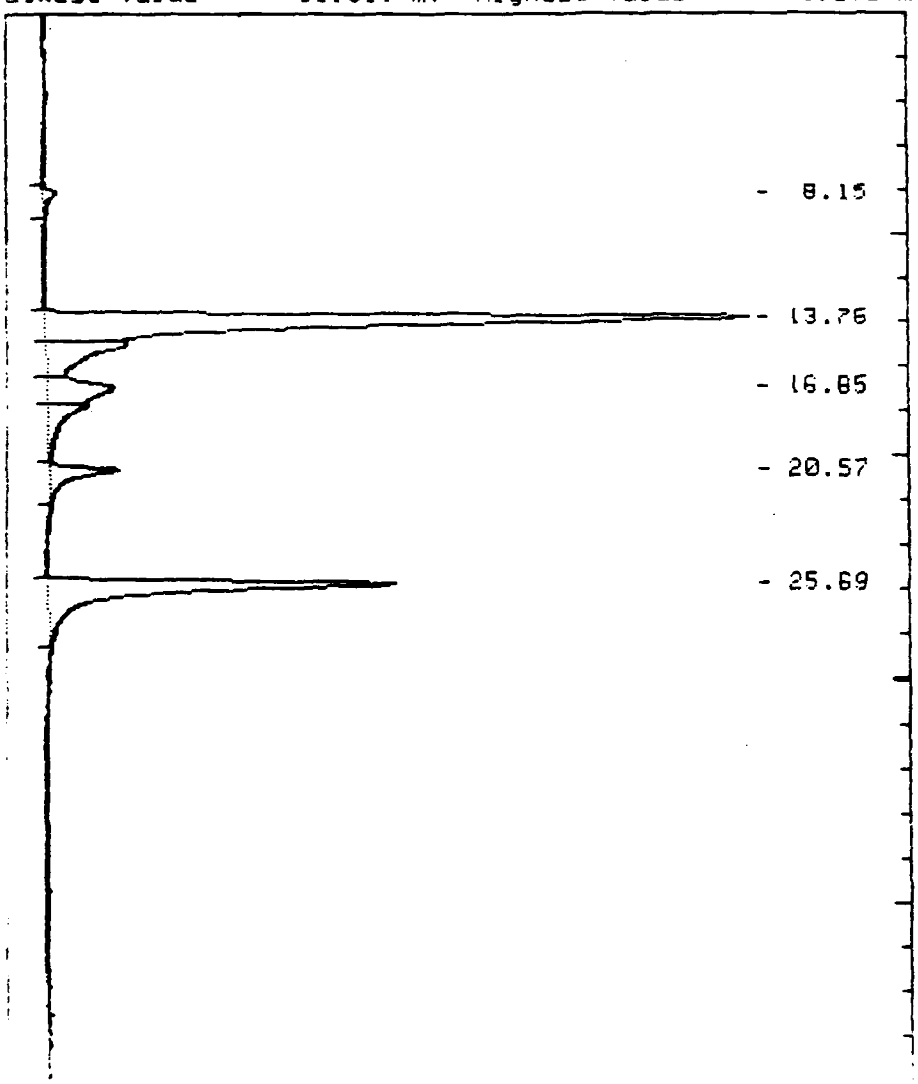


[illegible]
[illegible]
Noise Threshold = 2 uV   Area Threshold = [illegible] uV-sec
Sample Amount = 1 ug/l   Injection Vol = 1
Dilution Factor = 1   Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Area	Height	A/D Range	Peak Type	Ref Peak	% Delta Ret Time	Area Amount
1	8.15	TRICHLOROFLUOROMETHANE	.30376	40337	1133	Normal	1	1	-1.162	130639.1463
2	13.76	BROMOCHLOROMETHANE	297.28635	2106595	59577	Normal	2	2	0	7086.0812
3	16.85	CHLOROFORM	1.70528	303006	5827	Normal	2	3	0	177686.3831
4	20.57	1,1,1-TRICHLOROETHANE	1.39292	179398	5829	Normal	2	4	0	128792.7603
5	25.69	TRICHLOROETHENE	6.14021	1037436	29251	Normal	1	5	0	168957.3190

Total Amount = 306.83352

WARNING: File Already Exists. Area File Name Changed To J02RA117b
WARNING: File Already Exists, Area File Name Changed To J02RA117c
WARNING: File Already Exists, Area File Name Changed To J02RA117d
NOTE: Areas, Times, and Heights Stored in J02RA117d:,707,0,1
Start time= 0.00   Stop time= 60.00 minutes
Lowest Value = 31.010 mV Highest Value = 93.698 mV Scale factor = 1



```
=========================================================================================
   Sample Name SAMPLE#+IS-1ML 86 2970 - SW-3 (10ml) + IS(1ml)

   Date: 10/03/1986  22:50     Method: EXPERm            Operator: MRD
   Interrate: 701      Cycle#: 20      Channel#: A              Vial#: -1
=========================================================================================
Instrumental Parameters
-----------------------

Instrument: VARIAN3700
Column: 1%SP1000                              Column Length: 2    Meters
Start Temp-Time (deg-min): 50                  Ramp Hold (deg-min): 7
Program Rate (deg/min): 5     End Time-Temp (deg-min): 224
Prog Slope (# or Linear): L       Inj Port Temp: 200
Flowrate/Gas: 30ml/m He      Split Ratio:
Det 1-Type & Temp: HALL,300                   Det 2-Type & Temp: FID,300
Notes: EPA601/602 PRINCETON TESTING LABS
```

```
=========================================================================================
WARNING: You Do Not Have Enough Entries In Your Seq File To Update The Next Cycl
e
WARNING: File Already Exists, Raw Data Name Changed To J02RA117B
WARNING: File Already Exists, Raw Data Name Changed To J02RA117C
WARNING: File Already Exists, Raw Data Name Changed To J02RA117D
NOTE: The Data Was Stored In File J02RA117D:,707,0,1
```

*** AREA PERCENT REPORT ***

Data From Sample SAMPLE#+IS-1ML   Collected on 10/03/1986 22:50
Delay Time : 0.00 min   Run End : 60.00 min

Pk No.	Time [min]	Area [uV-sec]	Area %	B L	Ht [uV]	Normalized to Max Peak	Ar/Ht [sec]	A/D Range
1	8.147	40337	1.1001	1	1133	1.915	35.6	Normal
2	13.762	2106595	57.4509	2	59577	100.000	35.4	Normal
3	16.850	303006	8.2636	2	5827	14.384	52.0	Normal
4	20.566	179398	4.8925	2	5829	8.516	30.8	Normal
5	25.691	1037436	28.2929	1	29251	49.247	35.5	Normal

Total Area = 3666772 uV-sec   Area Reject = 0 uV-sec
Sampling Rate = 1.00 pts/sec   Bunch Factor = 3 pts
Noise Threshold = 2 uV   Area Threshold = 1000 uV-sec

***************** EXTERNAL STANDARD REPORT ****************************
Data From Sample SAMPLE#+IS-1ML   Collected on 10/03/1986 22:50
Delay Time.: 0.00   Run Time : 60.00
Area Reject = 0 uV   Sampling Rate = 1.00 pts/sec
Bunch Factor = 3 pts
Noise Threshold = 2 uV   Area Threshold = 1000 uV-sec
Sample Amount = 1 ug/l   Injection Vol = 1
Dilution Factor = 1   Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Area	Height	A/D Range	Peak Type	Ref Peak	% Delta Ret Time	Area/Amount

Sample Name SAMPLE#+IS-1ML 86-2970 - F.C. Hom - SW-4 (10ml) + IS (1ml)

Date: 10/04/1986 0:03 Method: EXPERm Operator: MRD
Interface: 701 Cycle#: 21 Channel#: A Vial#: -1

Instrumental Parameters

Instrument: VARIAN3700
Column: 1%SP1000 Column Length: 2 Meters
Start Temp-Time (deg-min): 50 Ramp Hold (deg-min): 7
Program Rate (deg/min): 5 End Time-Temp (deg-min): 224
Prog Slope (# or Linear): L Inj Port Temp: 200
Flowrate/Gas: 30ml/m He Split Ratio:
Det 1-Type & Temp: HALL,300 Det 2-Type & Temp: FID,300
Notes: EPA601/602 PRINCETON TESTING LABS

WARNING: You Do Not Have Enough Entries In Your Seq File To Update The Next Cycl
e

WARNING: File Already Exists, Raw Data Name Changed To J02RA117B
WARNING: File Already Exists, Raw Data Name Changed To J02RA117C
WARNING: File Already Exists, Raw Data Name Changed To J02RA117D
WARNING: File Already Exists, Raw Data Name Changed To J02RA117E
NOTE: The Data Was Stored In File J02RA117E:,707,0,1

*** AREA PERCENT REPORT ***

Data From Sample SAMPLE#+IS-1ML Collected on 10/04/1986 0:03
Delay Time : 0.00 min Run End : 60.00 min

Pk No.	Time [min]	Area [uV-sec]	Area %	B L	Ht [uV]	Normalized to Max Peak	Ar/Ht [sec]	A/D Range
1	8.093	36878	1.4182	1	1013	1.439	36.4	Normal
2	13.733	2563359	98.5818	1	66795	100.000	38.4	Normal

Total Area = 2600237 uV-sec Area Reject = 0 uV-sec
Sampling Rate = 1.00 pts/sec Bunch Factor = 3 pts
Noise Threshold = 2 uV Area Threshold = 1000 uV-sec

****************** EXTERNAL STANDARD REPORT ****************************

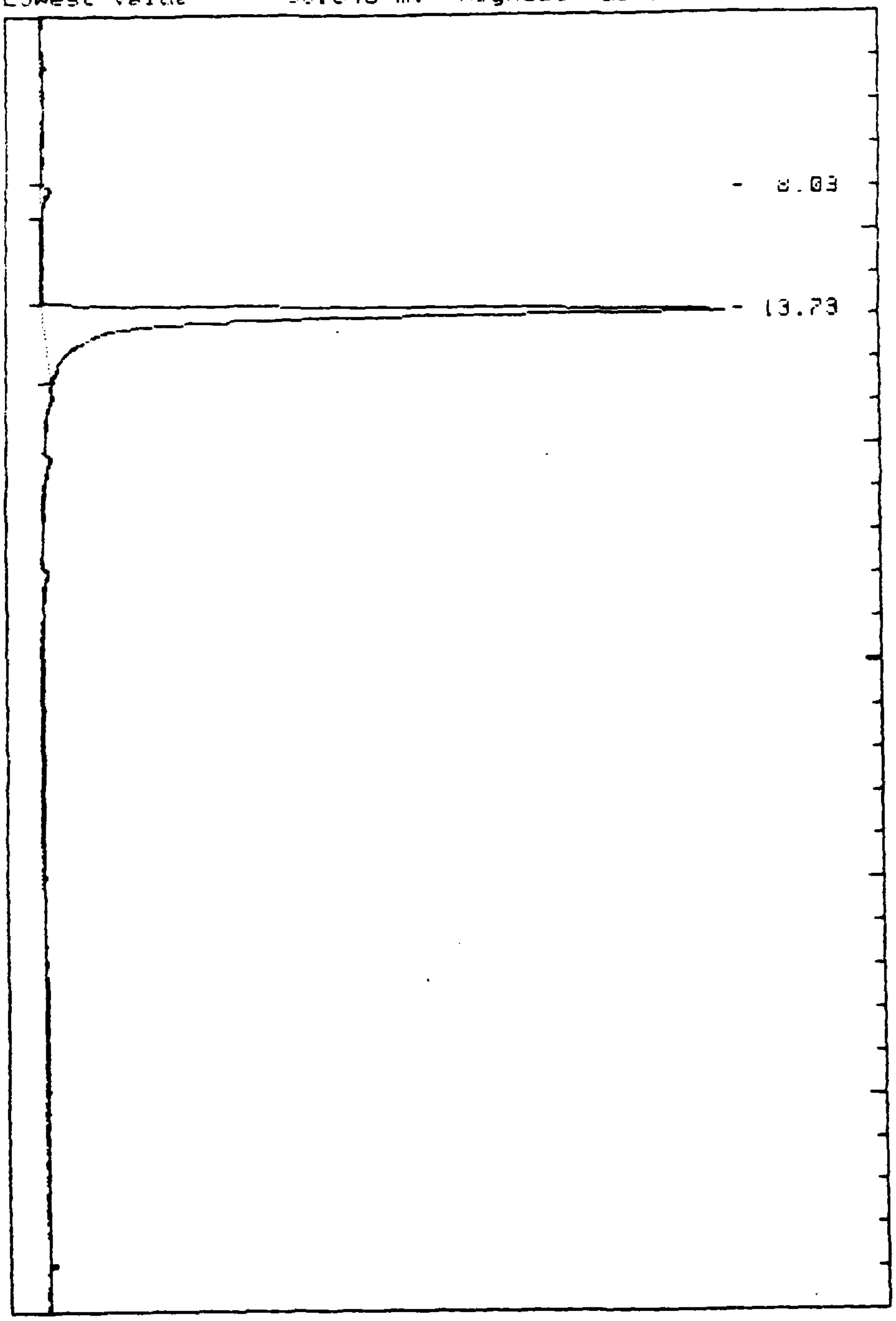
Data From Sample SAMPLE#+IS-1ML Collected on 10/04/1986 0:03
Delay Time : 0.00 Run Time : 60.00
Area Reject = 0 uV Sampling Rate = 1.00 pts/sec
Bunch Factor = 3 pts
Noise Threshold = 2 uV Area Threshold = 1000 uV-sec
Sample Amount = 1 ug/l Injection Vol = 1
Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Area	Height	A/D Range	Peak Type	Ref Peak	% Delta Ret Time	Area/Amount
1	8.09	TRICHLOROFLUOROMETHANE	.28229	36878	1013	Normal	1	1	-1.170	130639.1466
2	13.73	BROMOCHLOROMETHANE	361.74564	2563359	66795	Normal	1	2	1.3797	7086.0812

NOTE: Areas, Times, and Heights stored in [illegible]

Start time= 0.00 Stop time= 60.00 minutes

Lowest Value = 30.646 mV Highest Value = 101.440 mV Scale factor = 1



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Sample Name SAMPLE#+IS-1ML F·C·Heat·Sw-4(10ml)

Date: 10/04/1986 0:03 Method: eXPERm Operator: MRD

Interface: 701 Cycle#: 21 Channel#: B Vial#: -1

==

Instrumental Parameters

Instrument: VARIAN3700

Column: [illegible] Column Length: 2 Meters
Start Temp-Time (deg-min): 50 Ramp Hold (deg-min): 7
Program Rate (deg/min): 5 End Time-Temp (deg-min): 224
Prog Slope (# or Linear): L Inj Port Temp: 200
Flowrate/Gas: 30ml/m He Split Ratio:
Det 1-Type & Temp: HALL,300 Det 2-Type & Temp: PID,300
Notes: EPA601/602 PRINCETON TESTING LABS

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WARNING: File Already Exists, Raw Data Name Changed To J02RB1175
WARNING: File Already Exists, Raw Data Name Changed To J02RB117C
WARNING: File Already Exists, Raw Data Name Changed To J02RB117D
WARNING: File Already Exists, Raw Data Name Changed To J02RB117E
NOTE: The Data Was Stored In File J02RB117E:,707,0,1

*** AREA PERCENT REPORT ***

Data From Sample SAMPLE#+IS-1ML Collected on 10/04/1986 0:03
Delay Time : 0.00 min Run End : 60.00 min

Pk No.	Time [min]	Area [uV-sec]	Area %	B L	Ht [uV]	Normalized to Max Peak	Ar/Ht [sec]	A/D Range
1	7.387	132208	23.5536	2	600	30.811	220.5	Normal
2	9.378	429100	76.4464	2	12252	100.000	35.0	Normal

Total Area = 561308 uV-sec Area Reject = 0 uV-sec
Sampling Rate = 1.00 pts/sec Bunch Factor = 3 pts
Noise Threshold = 2 uV Area Threshold = 1000 uV-sec

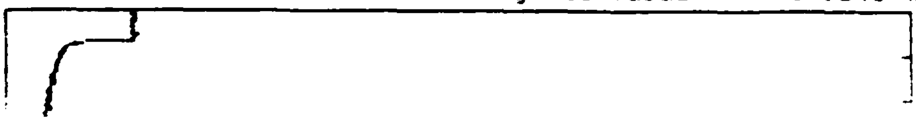
***************** EXTERNAL STANDARD REPORT ****************************

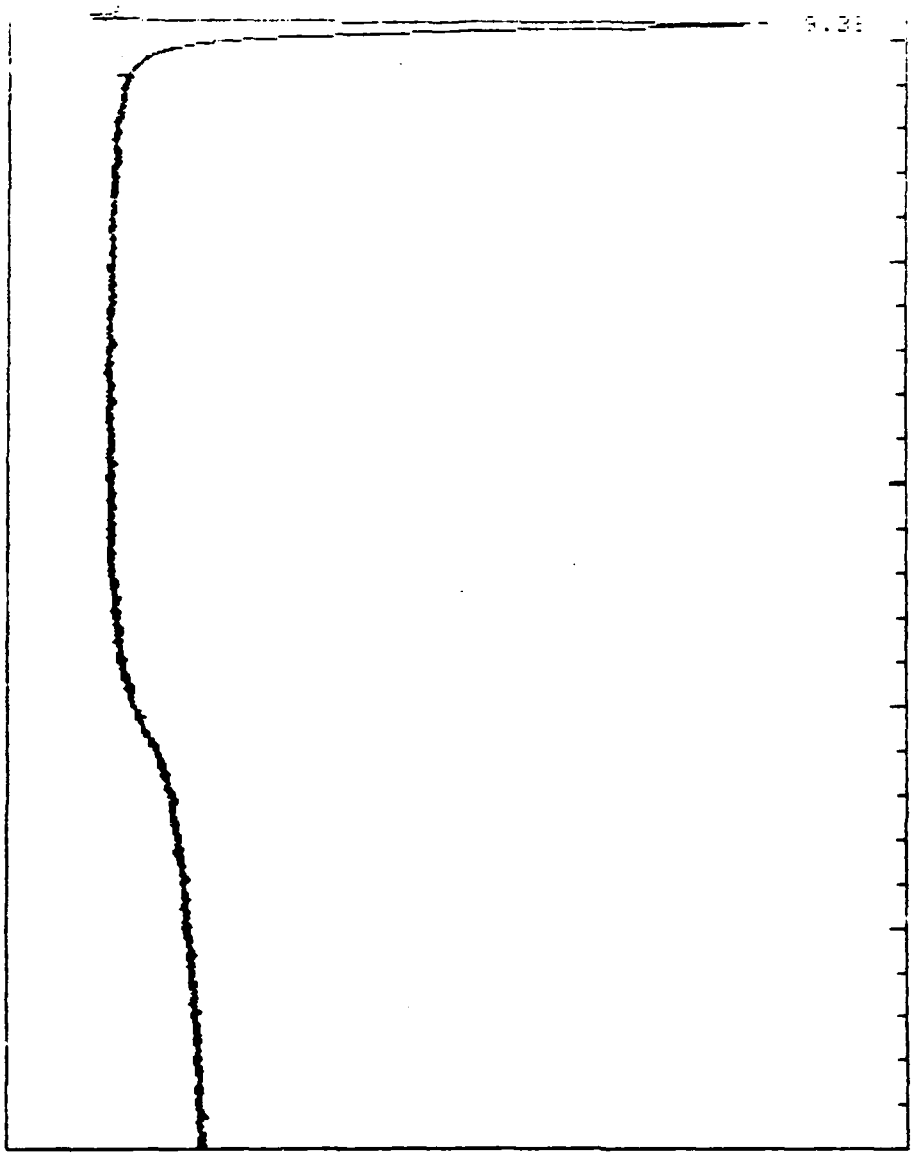
Data From Sample SAMPLE#+IS-1ML Collected on 10/04/1986 0:03
Delay Time : 0.00 Run Time : 60.00
Area Reject = 0 uV Sampling Rate = 1.00 pts/sec
Bunch Factor = 3 pts
Noise Threshold = 2 uV Area Threshold = 1000 uV-sec
Sample Amount = 1 ug/l Injection Vol = 1
Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Area	Height	A/D Range	Peak Type	Ref Peak	% Delta Ret Time	Area/Amount
2	9.38	BENZENE	27.69417	429100	12252	Normal	2	2	0	15494.2366

Total Amount = 27.69417

WARNING: File Already Exists, Area File Name Changed To J02RB117b
WARNING: File Already Exists, Area File Name Changed To J02RB117c
WARNING: File Already Exists, Area File Name Changed To J02RB117d
WARNING: File Already Exists, Area File Name Changed To J02RB117e
NOTE: Areas, Times, and Heights Stored in J02RB117e:,707,0,1
Start time= 0.00 Stop time= 60.00 minutes
Lowest Value = 5.697 mV Highest Value = 19.841 mV Scale factor = 1





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Sample Name SAMPLE#+IS-1ML 86·2970 – Spl· Production well (10ml)

Date: 10/04/1986 1:15 Method: EXPERm Operator: MRD
Interface: 701 Cycle#: 22 Channel#: A Vial#: -1

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Instrumental Parameters

Instrument: VARIAN3700
Column: 1%SP1000 Column Length: 2 Meters
Start Temp-Time (deg-min): 50 Ramp Hold (deg-min): 7
Program Rate (deg/min): 5 End Time-Temp (deg-min): 224
Prog Slope (# or Linear): L Inj Port Temp: 200
Flowrate/Gas: 30ml/m He Split Ratio:
Det 1-Type & Temp: HALL,300 Det 2-Type & Temp: FID,300
Notes: EPA601/602 PRINCETON TESTING LABS

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WARNING: You Do Not Have Enough Entries In Your Seq File To Update The Next Cycl

Sample Name SAMPLE#+IS-1ML 86 2770 - Spl· Production well (1cml)

Date: 10/04/1986 1:15 Method: EXPEPm Operator: MPD
Interface: 701 Cycle#: 22 Channel#: A Vial#: -1

Instrumental Parameters

Instrument: VARIAN3700
Column: 1%SP1000 Column Length: 2 Meters
Start Temp-Time (deg-min): 50 Ramp Hold (deg-min): 7
Program Rate (deg/min): 5 End Time-Temp (deg-min): 224
Prog Slope (# or Linear): L Inj Port Temp: 200
Flowrate/Gas: 30ml/m He Split Ratio:
Det 1-Type & Temp: HALL,300 Det 2-Type & Temp: FID,300
Notes: EPA601/602 PRINCETON TESTING LABS

WARNING: You Do Not Have Enough Entries In Your Seq File To Update The Next Cycle
WARNING: File Already Exists, Raw Data Name Changed To J02RA117B
WARNING: File Already Exists, Raw Data Name Changed To J02RA117C
WARNING: File Already Exists, Raw Data Name Changed To J02RA117D
WARNING: File Already Exists, Raw Data Name Changed To J02RA117E
WARNING: File Already Exists, Raw Data Name Changed To J02RA117F
NOTE: The Data Was Stored In File J02RA117F:,707,0,1

*** AREA PERCENT REPORT ***

Data From Sample SAMPLE#+IS-1ML Collected on 10/04/1986 1:15
Delay Time : 0.00 min Run End : 60.00 min

Pk No.	Time [min]	Area [uV-sec]	Area %	B L	Ht [uV]	Normalized to Max Peak	Ar/Ht [sec]	A/D Range
1	3.630	46398	.2699	1	2588	.575	17.9	Normal
2	8.008	105001	.6108	1	3102	1.300	33.9	Normal
3	12.932	42906	.2496	1	2360	.531	18.2	Normal
4	13.678	2503138	14.5600	2	72792	31.000	34.4	Normal
5	14.952	1992208	11.5881	2	77166	24.672	25.8	Normal
6	16.328	8074654	46.9680	2	200547	100.000	40.3	Normal
7	17.636	1326072	7.7134	2	40547	16.423	32.7	Normal
8	20.444	1205649	7.0129	1	43262	14.931	27.9	Normal
9	25.651	1895801	11.0273	1	56272	23.478	33.7	Normal

Total Area = 17191827 uV-sec Area Reject = 0 uV-sec
Sampling Rate = 1.00 pts/sec Bunch Factor = 3 pts
Noise Threshold = 2 uV Area Threshold = 1000 uV-sec

****************** EXTERNAL STANDARD REPORT ****************************

Data From Sample SAMPLE#+IS-1ML Collected on 10/04/1986 1:15
Delay Time : 0.00 Run Time : 60.00
Area Reject = 0 uV Sampling Rate = 1.00 pts/sec
Bunch Factor = 3 pts
Noise Threshold = 2 uV Area Threshold = 1000 uV-sec
Sample Amount = 1 ug/l Injection Vol = 1
Dilution Factor = 1 Multiplier Amount = 1.0000

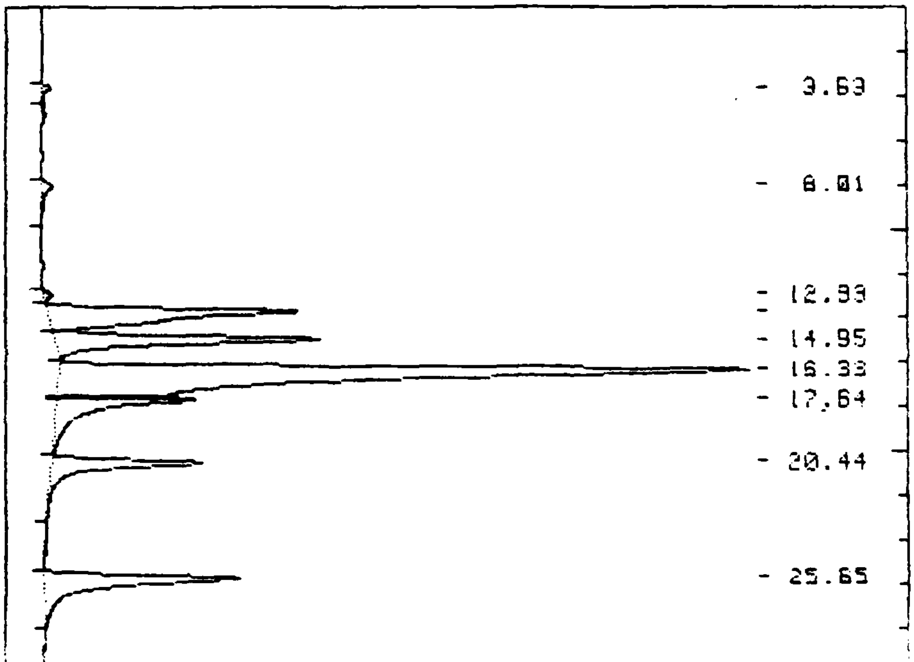
Peak Ret Peak Concentration as A/D Peak Ret % Delta

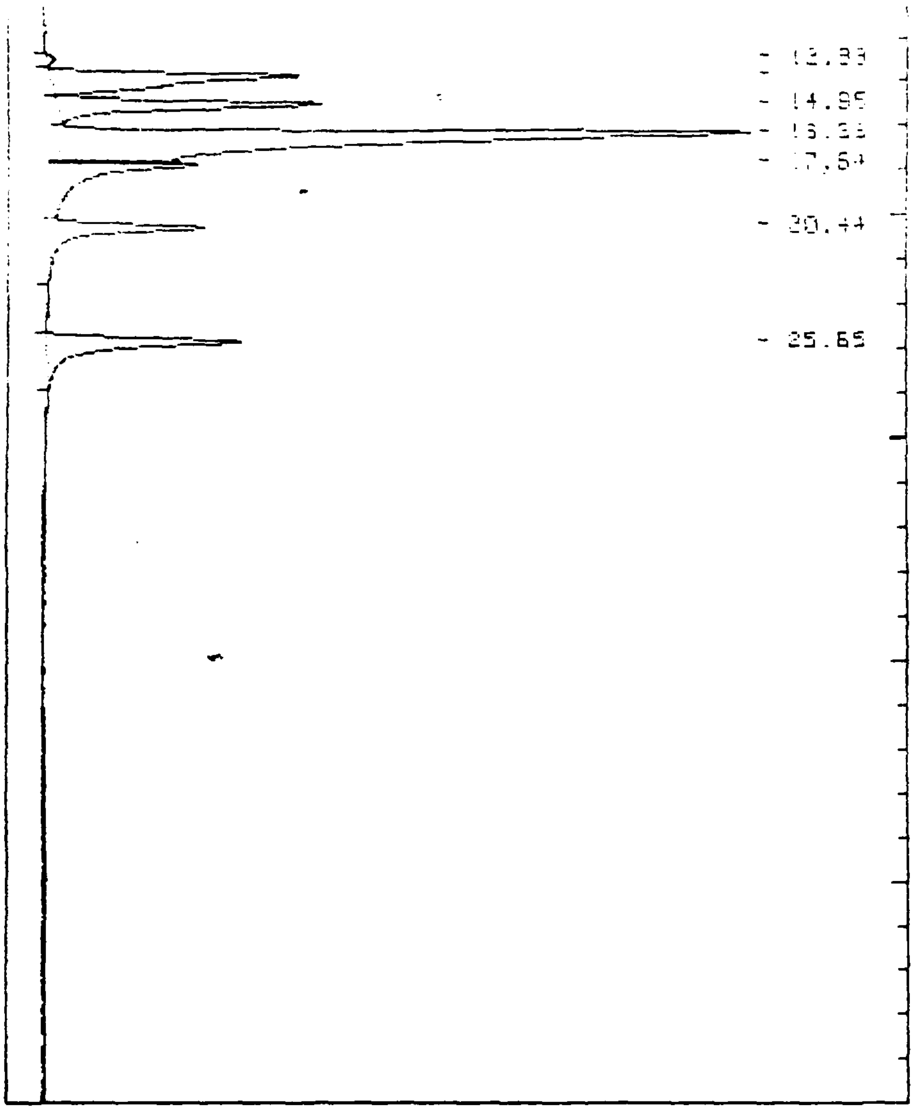
Data From Sample SAMPLE#+IS-1ML Collected on [illegible]
Delay Time : 0.00 Run Time : 60.00
Area Reject = 0 uV Sampling Rate = 1.00 pts/sec
Bunch Factor = 3 pts
Noise Threshold = 2 uV Area Threshold = 1000 uV-sec
Sample Amount = 1 ug/l Injection Vol = 1
Dilution Factor = 1 Multiplier Amount = 1.0000

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Area	Height	A/D Range	Peak Type	Ref Peak	% Delta Ret Time	Area/Amount
1	3.63	VINYL CHLORIDE	.49345	46398	2588	Normal	1	1	0	94027.7457
2	8.01	METHYLENE CHLORIDE	.63869	105001	3102	Normal	1	2	0	164399.0017
3	12.93	1,1-DICHLOROETHENE	.34595	42906	2360	Normal	1	3	0	124025.0189
4	13.68	BROMOCHLOROMETHANE	353.24720	2503138	72792	Normal	2	4	0	7086.0812
5	14.95	1,1-DICHLOROETHANE	15.71574	1992208	77166	Normal	2	5	0	126765.1342
6	16.33	1,2-DICHLOROETHENE	65.54571	8074654	200547	Normal	2	6	0	123191.1928
7	17.64	1,2-DICHLOROETHANE	14.09557	1326072	40547	Normal	2	7	0	94077.2790
8	20.44	1,1,1-TRICHLOROETHANE	9.36115	1205649	43262	Normal	1	8	0	128792.7803
9	25.65	TRICHLOROETHENE	11.22056	1895801	56272	Normal	1	9	1.4773	168957.5130

Total Amount = 470.66401

WARNING: File Already Exists, Area File Name Changed To J02RA117b
WARNING: File Already Exists, Area File Name Changed To J02RA117c
WARNING: File Already Exists, Area File Name Changed To J02RA117d
WARNING: File Already Exists, Area File Name Changed To J02RA117e
WARNING: File Already Exists, Area File Name Changed To J02RA117f
NOTE: Areas, Times, and Heights Stored in J02RA117f:,707,0,1
Start time= 0.00 Stop time= 60.00 minutes
Lowest Value = 23.679 mV Highest Value = 240.145 mV Scale factor = 1





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Sample Name SAMPLE#+IS-1ML F.C. Hart 86-2970 - Production well (conv)

Date: 10/04/1986 1:15 Method: eXPERm Operator: MRD
Interface: 701 Cycle#: 22 Channel#: B Vial#: -1

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Instrumental Parameters

Instrument: VARIAN3700
Column: 1%SP1000 Column Length: 2 Meters
Start Temp-Time (deg-min): 50 Ramp Hold (deg-min): 7
Program Rate (deg/min): 5 End Time-Temp (deg-min): 224
Prog Slope (# or Linear): L Inj Port Temp: 200
Flowrate/Gas: 30ml/m He Split Ratio:
Det 1-Type & Temp: HALL,300 Det 2-Type & Temp: FID,300
Notes: EPA601/602 PRINCETON TESTING LABS

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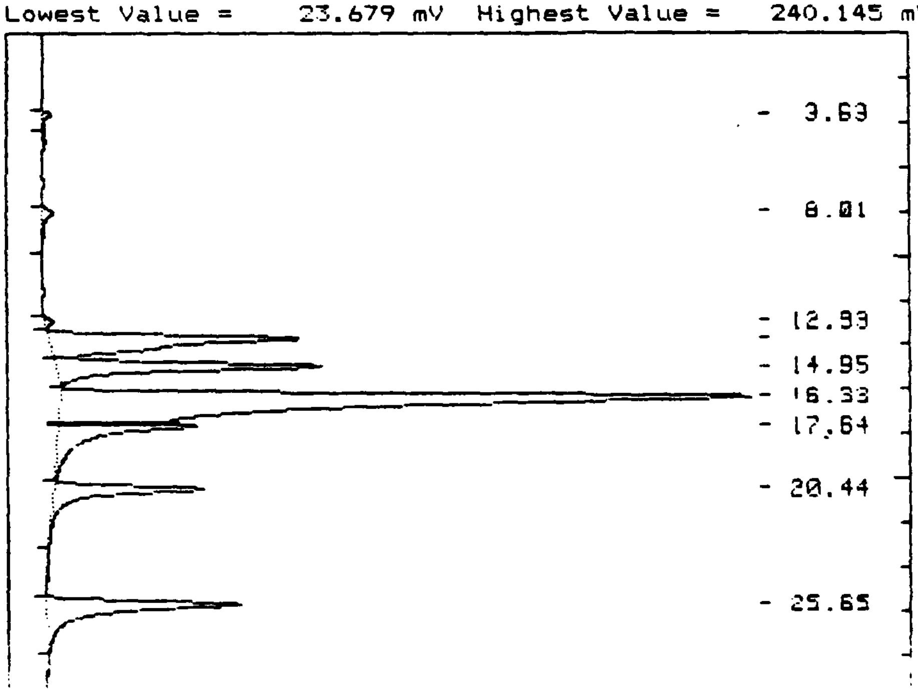
WARNING: File Already Exists, Raw Data Name Changed To J02RB117B
WARNING: File Already Exists, Raw Data Name Changed To J02RB117C
WARNING: File Already Exists, Raw Data Name Changed To J02RB117D
WARNING: File Already Exists, Raw Data Name Changed To J02RB117E
WARNING: File Already Exists, Raw Data Name Changed To [illegible]

```
Data From Sample SAMPLE#+IS-1ML          Collected on 12.04 1986   1:15
Delay Time :    0.00                      Run Time :    60.00
Area Reject =       0 uV   Sampling Rate =    1.00 pts/sec
Bunch Factor = 3 pts
Noise Threshold = 2 uV      Area Threshold = 1000 uV-sec
Sample Amount = 1 ug/l             Injection Vol = 1
Dilution Factor = 1       Multiplier Amount =     1.0000
```

Peak Num	Ret Time	Peak Name	Concentration as ug/l	Area	Height	A/D Range	Peak Type	Ref Peak	% Delta Ret Time	Area/Amount
1	3.63	VINYL CHLORIDE	.49345	46398	2588	Normal	1	1	0	94027.7457
2	8.01	METHYLENE CHLORIDE	.63869	105001	3102	Normal	1	2	0	164399.0017
3	12.93	1,1-DICHLOROETHENE	.34595	42906	2360	Normal	1	3	0	124025.0189
4	13.68	BROMOCHLOROMETHANE	353.24720	2503138	72772	Normal	2	4	0	7086.0812
5	14.95	1,1-DICHLOROETHANE	15.71574	1992208	77166	Normal	2	5	0	126765.1342
6	16.33	1,2-DICHLOROETHENE	65.54571	8074654	200547	Normal	2	6	0	123191.1928
7	17.64	1,2-DICHLOROETHANE	14.09557	1326072	40547	Normal	2	7	0	94077.2790
8	20.44	1,1,1-TRICHLOROETHANE	9.36115	1205649	43262	Normal	1	8	0	128792.7803
9	25.65	TRICHLOROETHENE	11.22056	1895801	56272	Normal	1	9	1.4773	168957.8190

Total Amount = 470.66401

```
WARNING: File Already Exists, Area File Name Changed To J02RA117b
WARNING: File Already Exists, Area File Name Changed To J02RA117c
WARNING: File Already Exists, Area File Name Changed To J02RA117d
WARNING: File Already Exists, Area File Name Changed To J02RA117e
WARNING: File Already Exists, Area File Name Changed To J02RA117f
NOTE: Areas, Times, and Heights Stored in J02RA117f:,707,0,1
 Start time=    0.00              Stop time=    60.00 minutes
Lowest Value =    23.679 mV  Highest Value =    240.145 mV Scale factor =    1
```



Quantitation Report   File: 29701VA

Data 29701VA.TI
10/06/86 10:27:00
Sample 86-2970 F.C. HART#PROD. WELL
Conds. 10ML PURGE
Submitted by: F.C.H   Analyst: RD

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. Fac. from Library Entry

No	Name	
1	CI01 BROMOCHLOROMETHANE	****INTERNAL STANDARD #1****
2	CI10 1,4-DIFLUOROBENZENE	****INTERNAL STANDARD #2****
3	CI20 CHLOROBENZENE-D5	****INTERNAL STANDARD #3****
4	CHLOROMETHANE	
5	BROMOMETHANE	
6	VINYL CHLORIDE	
7	CHLOROETHANE	
8	METHYLENE CHLORIDE	
9	1,1-DICHLOROETHENE	
10	1,1-DICHLOROETHANE	
11	1,2-DICHLOROETHYLENE(TRANS)	
12	CHLOROFORM	
13	1,2-DICHLOROETHANE	
14	1,1,1-TRICHLOROETHANE	
15	CARBON TETRACHLORIDE	
16	BROMODICHLOROMETHANE	
17	1,2-DICHLOROPROPANE	
18	TRANS-1,3-DICHLOROPROPENE	
19	TRICHLOROETHYLENE	
20	DIBROMOCHLOROMETHANE	
21	1,1,2-TRICHLOROETHANE	
22	BENZENE	
23	CIS-1,3-DICHLOROPROPENE	
24	CHLOROVINYL ETHYL ETHER	
25	BROMOFORM	
26	TETRACHLOROETHYLENE	
27	1,1,2,2-TETRACHLOROETHANE	
28	TOLUENE	
29	CHLOROBENZENE	
30	ETHYLBENZENE	
31	O-XYLENE	
32	CS15 1,2-DICHLOROETHANE-D4	****SURROGATE #1****
33	CS05 TOLUENE-D8	****SURROGATE #2****
34	CS10 4-BROMOFLUOROBENZENE	****SURROGATE #3****

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	49	316	9:57	1	1.000	A BB	310020.	50.000 UG/L	7.43
2	114	645	20:19	2	1.000	A BB	857764.	50.000 UG/L	7.43
3	117	802	25:16	3	1.000	A BB	1185410.	50.000 UG/L	7.43
4	NOT FOUND								
5	NOT FOUND								
6	62	123	3:52	1	0.389	A BB	64.	0.023 UG/L	0.00
7	NOT FOUND								
8	84	222	7:00	1	0.703	A BB	7816.	6.976 UG/L	1.04
9	96	365	11:30	1	1.155	A BB	199616.	73.215 UG/L	10.88
10	63	344	10:50	1	1.089	A BB	84808.	14.838 UG/L	2.21
11	96	365	11:30	1	1.155	A BB	199616.	73.215 UG/L	10.88
12	NOT FOUND								
13	NOT FOUND								

14	[illegible]	447	14:05	2	0.693	A BB	11576	2.729	UG/L	0.41
15	NOT FOUND									
16	NOT FOUND									
17	NOT FOUND									
18	NOT FOUND									
19	130	545	17:10	2	0.845	A BB	50184.	7.546	UG/L	1.12
20	NOT FOUND									
21	NOT FOUND									
22	78	559	17:37	2	0.867	A*BB	240.	0.011	UG/L	0.00
23	NOT FOUND									
24	63	645	20:19	2	1.000	A BB	226256.	224.682	UG/L	33.40
25	NOT FOUND									
26	NOT FOUND									
27	NOT FOUND									
28	91	771	24:17	3	0.961	A*BB	224.	0.009	UG/L	0.00
29	NOT FOUND									
30	NOT FOUND									
31	NOT FOUND									
32	65	403	12:42	1	1.275	A BB	209352.	45.088	UG/L	6.70
33	98	765	24:06	3	0.954	A BB	1724630.	53.730	UG/L	7.99
34	95	968	30:30	3	1.207	A BB	843464.	52.235	UG/L	7.76

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	9:46	1.02	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	20:06	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	25:03	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	1:44		0.177						
5	2:52		0.294						
6	3:41	1.05	0.377	1.03	0.02	200.00	0.000	0.456	0.00
7	4:43		0.484						
8	6:46	1.03	0.694	1.01	6.98	200.00	0.006	0.181	0.03
9	11:20	1.01	1.161	0.99	73.21	200.00	0.161	0.440	0.37
10	10:37	1.02	1.087	1.00	14.84	200.00	0.068	0.922	0.07
11	11:20	1.01	1.161	0.99	73.21	200.00	0.161	0.440	0.37
12	11:49		1.210						
13	12:34		1.287						
14	13:52	1.02	0.690	1.00	2.73	200.00	0.003	0.247	0.01
15	14:14		0.708						
16	14:41		0.730						
17	16:08		0.803						
18	16:21		0.813						
19	16:57	1.01	0.843	1.00	7.55	200.00	0.015	0.388	0.04
20	17:25		0.867						
21	17:35		0.875						
22	17:31	1.01	0.871	0.99	0.01	200.00	0.000	1.330	0.00
23	17:37		0.876						
24	20:06	1.01	1.000	1.00	224.68	200.00	0.066	0.059	1.12
25	20:06		1.000						
26	22:39		0.904						
27	22:28		0.897						
28	24:02	1.01	0.960	1.00	0.01	200.00	0.000	1.020	0.00
29	25:10		1.005						
30	27:21		1.092						
31	33:23		1.333						
32	12:28	1.02	1.277	1.00	45.09	50.00	0.675	0.749	0.90
33	23:51	1.01	0.952	1.00	53.73	50.00	1.455	1.354	1.07
34	30:09	1.01	1.204	1.00	52.24	50.00	0.712	0.681	1.04

PROCEDURE TCA DIAGNOSTIC REPORT 10/14/86 14 22 1
DATA FILE 29701VA
REFERENCE VO
NAME LIST VOA INITIALIZATION OPTION: 2 PROCESSING OPTION 3
REPORT: VV

< ---- STANDARDS	-----		><	--- PLUS UNKNOWNS	---		><	- LIST NAMES - >
PROC	USED	POSS	RMS	PROC	USED	POSS	RMS	STANDARD/UNKNOWN
3	2	1	0	34	12	1	103	VV/VB

34 COMPOUNDS PROCESSED, 11 FOUND

< COMPOUND		><	------------ SEARCH				------------ ><	SAT ><	------ CHRO			-------
NO	LIB	ENTRY	REF	PRED	SEL	DELTA	PEAKS	FIT	PEAKS	M/Z	TOP	DELTA	PEA
1	VO	4	303	316	316	.	1	1000	.	49	316	.	
2	VO	5	-633	645	.	.	.	.	.	114	645	.	
3	VO	6	-791	802	802	.	1	997	.	117	802	.	
4	VO	7	45	57	.	.	.	.	.	50	.	.	
5	VO	8	87	99	.	.	.	.	.	94	.	.	
6	VO	9	-111	123	.	.	.	.	.	62	123	.	
7	VO	10	-145	157	.	.	.	.	.	64	.	.	
8	VO	11	-210	222	222	.	1	980	.	84	222	.	
9	VO	13	-355	367	365	-2	1	993	.	96	365	.	
10	VO	14	-332	344	344	.	1	973	.	63	344	.	
11	VO	15	-355	367	365	-2	1	966	.	96	365	.	
12	VO	16	-370	382	.	.	.	.	.	83	.	.	
13	VO	17	-394	406	.	.	.	.	.	62	.	.	
14	VO	18	-434	446	447	1	1	892	.	97	447	.	
15	VO	19	-446	458	.	.	.	.	.	117	.	.	
16	VO	20	-461	473	.	.	.	.	.	83	.	.	
17	VO	21	-507	519	.	.	.	.	.	63	.	.	
13	VO	36	-515	527	.	.	.	.	.	75	.	.	
19	VO	22	-534	546	545	-1	1	993	.	130	545	.	
20	VO	38	-549	561	.	.	.	.	.	129	.	.	
21	VO	24	-554	566	.	.	.	.	.	97	.	.	
22	VO	23	-552	564	.	.	.	.	.	78	559	.	
23	VO	37	-555	567	.	.	.	.	.	75	.	.	
24	VO	35	-634	645	.	.	.	.	.	63	645	.	
25	VO	25	-634	645	.	.	.	.	.	173	.	.	
26	VO	26	711	722	.	.	.	.	.	166	.	.	
27	VO	27	705	716	.	.	.	.	.	83	.	.	
28	VO	28	-759	770	.	.	.	.	.	91	771	.	
29	VO	29	-795	806	.	.	.	.	.	112	.	.	
30	VO	30	-862	873	.	.	.	.	.	106	.	.	
31	VO	39	-1053	1064	.	.	.	.	.	91	.	.	
32	VO	2	-391	403	403	.	1	999	.	65	403	.	
33	VO	3	-753	764	765	1	1	996	.	98	765	.	
34	VO	1	957	968	968	.	1	990	.	95	968	.	

PROCEDURE. TCA DIAGNOSTIC REPORT 10/06/86 11 30
DATA FILE. 29702V
REFERENCE: VO
NAME LIST VOA INITIALIZATION OPTION: 2 PROCESSING OPTION: 3
REPORT: VV

< ---- STANDARDS	----- ><		--- PLUS	UNKNOWNS	--- ><		- LIST NAMES - >
PROC	USED	POSS	RMS	PROC	USED	POSS	RMS	STANDARD/UNKNOWN
3	2	2	795	34	10	1	96	VV/VB

34 COMPOUNDS PROCESSED, 9 FOUND

< COMPOUND		><	------------		SEARCH	------------		>< SAT	><	------ CHRO	-------	
NO	LIB	ENTRY	REF	PRED	SEL	DELTA	PEAKS	FIT	PEAKS	M/Z	TOP	DELTA	PEAK
1	VO	4	303	309	316	7	2	999	.	49	316	.	
2	VO	5	-633	645	.	.	.	.	.	114	645	.	
3	VO	6	-791	806	803	-3	1	997	.	117	803	.	
4	VO	7	45	57	.	.	.	.	.	50	.	.	
5	VO	8	87	99	.	.	.	.	.	94	.	.	
6	VO	9	-111	123	.	.	.	.	.	62	.	.	
7	VO	10	-145	157	.	.	.	.	.	64	.	.	
8	VO	11	-210	222	222	.	1	967	.	84	222	.	
9	VO	13	-355	367	365	-2	1	804	.	96	365	.	
10	VO	14	-332	344	344	.	1	906	.	63	344	.	
11	VO	15	-355	367	.	.	.	.	.	96	365	.	
12	VO	16	-370	382	.	.	.	.	.	83	.	.	
13	VO	17	-394	406	.	.	.	.	.	62	.	.	
14	VO	18	-434	446	.	.	.	.	.	97	446	.	
15	VO	19	-446	458	.	.	.	.	.	117	.	.	
16	VO	20	-461	473	.	.	.	.	.	83	.	.	
17	VO	21	-507	519	.	.	.	.	.	63	.	.	
18	VO	36	-515	527	.	.	.	.	.	75	.	.	
19	VO	22	-534	546	545	-1	1	988	.	130	545	.	
20	VO	38	-549	561	.	.	.	.	.	129	.	.	
21	VO	24	-554	566	.	.	.	.	.	97	.	.	
22	VO	23	-552	564	.	.	.	.	.	78	564	.	
23	VO	37	-555	567	.	.	.	.	.	75	.	.	
24	VO	35	-634	645	.	.	.	.	.	63	645	.	
25	VO	25	-634	645	.	.	.	.	.	173	.	.	
26	VO	26	711	722	.	.	.	.	.	166	.	.	
27	VO	27	705	716	.	.	.	.	.	83	.	.	
28	VO	28	-759	770	.	.	.	.	.	91	771	.	
29	VO	29	-795	806	.	.	.	.	.	112	.	.	
30	VO	30	-862	873	.	.	.	.	.	106	.	.	
31	VO	39	-1053	1064	.	.	.	.	.	91	.	.	
32	VO	2	-391	403	403	.	1	995	.	65	403	.	
33	VO	3	-753	764	765	1	1	998	.	98	765	.	
34	VO	1	960	971	970	-1	1	996	.	95	970	.	

Quantitation Report   File: 29702V

Data 29702V TI
10/06/86 9:25:00
Sample
Conds
Submitted by: Analyst: RD

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp fac. from Library Entry

No	Name
1	CI01 BROMOCHLOROMETHANE ****INTERNAL STANDARD #1****
2	CI10 1,4-DIFLUOROBENZENE ****INTERNAL STANDARD #2****
3	CI20 CHLOROBENZENE-D5 ****INTERNAL STANDARD #3****
4	CHLOROMETHANE
5	BROMOMETHANE
6	VINYL CHLORIDE
7	CHLOROETHANE
8	METHYLENE CHLORIDE
9	1,1-DICHLOROETHENE
10	1,1-DICHLOROETHANE
11	1,2-DICHLOROETHYLENE(TRANS)
12	CHLOROFORM
13	1,2-DICHLOROETHANE
14	1,1,1-TRICHLOROETHANE
15	CARBON TETRACHLORIDE
16	BROMODICHLOROMETHANE
17	1,2-DICHLOROPROPANE
18	TRANS-1,3-DICHLOROPROPENE
19	TRICHLOROETHYLENE
20	DIBROMOCHLOROMETHANE
21	1,1,2-TRICHLOROETHANE
22	BENZENE
23	CIS-1,3-DICHLOROPROPENE
24	CHLOROVINYL ETHYL ETHER
25	BROMOFORM
26	TETRACHLOROETHYLENE
27	1,1,2,2-TETRACHLOROETHANE
28	TOLUENE
29	CHLOROBENZENE
30	ETHYLBENZENE
31	O-XYLENE
32	CS15 1,2-DICHLOROETHANE-D4 ****SURROGATE #1****
33	CS05 TOLUENE-D8 ****SURROGATE #2****
34	CS10 4-BROMOFLUOROBENZENE ****SURROGATE #3****

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	49	316	9:57	1	1.000	A BB	332696.	50.000 UG/L	9.93
2	114	645	20:19	2	1.000	A BB	856624.	50.000 UG/L	9.93
3	117	803	25:18	3	1.000	A BB	1195730.	50.000 UG/L	9.93
4	NOT FOUND								
5	NOT FOUND								
6	NOT FOUND								
7	NOT FOUND								
8	84	222	7:00	1	0.703	A BB	7896.	6.567 UG/L	1.30
9	96	365	11:30	1	1.155	A BB	800.	0.273 UG/L	0.05
10	63	344	10:50	1	1.089	A BB	128.	0.021 UG/L	0.00
11	96	365	11:30	1	1.155	A BB	800.	0.273 UG/L	0.05
12	NOT FOUND								
13	NOT FOUND								

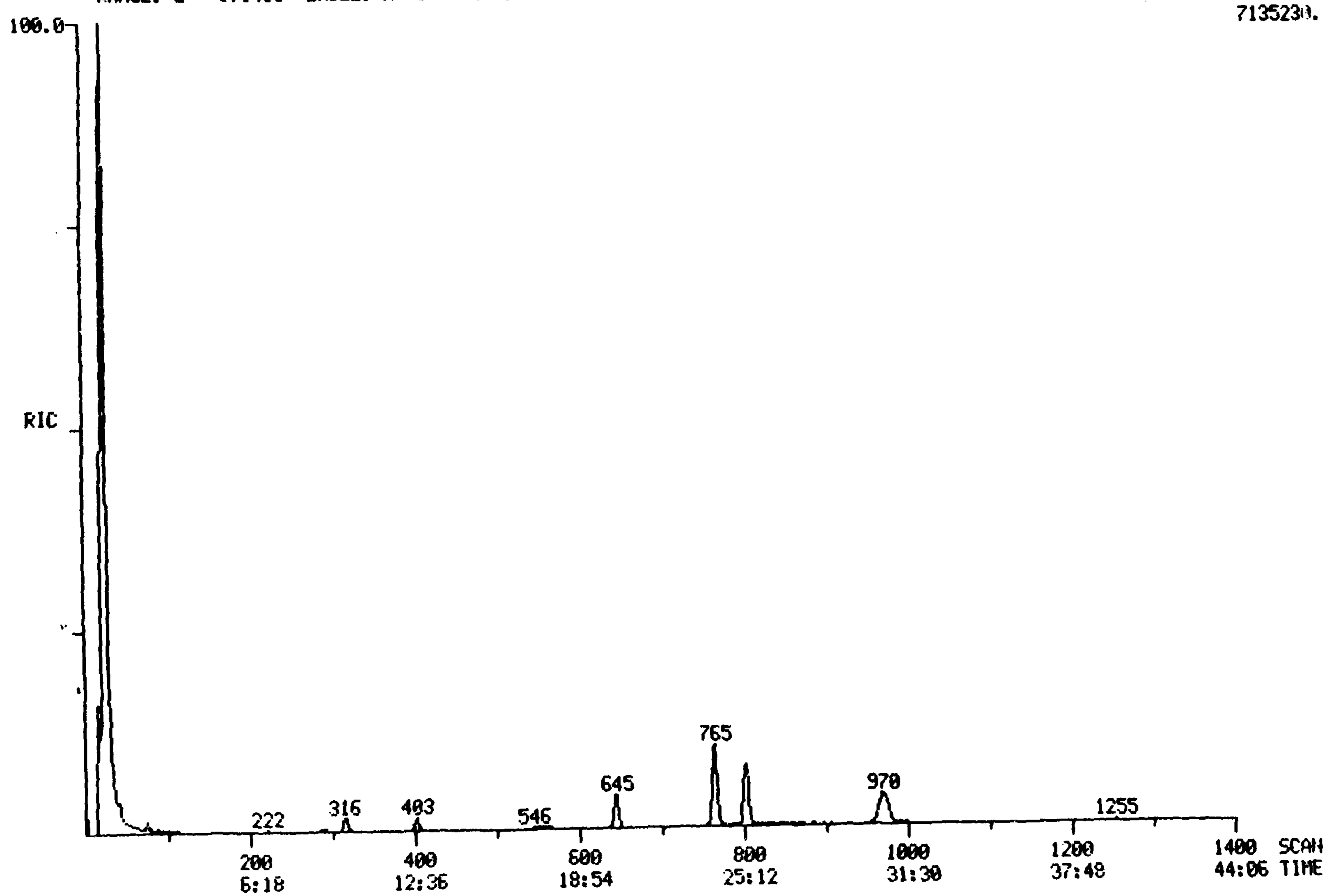
14	[illegible]	446	14:03	2	0.691	A BB	256.	0.060 UG/L	0.01
15	NOT FOUND								
16	NOT FOUND								
17	NOT FOUND								
18	NOT FOUND								
19	130	545	17:10	2	0.845	A BB	12368.	1.862 UG/L	0.37
20	NOT FOUND								
21	NOT FOUND								
22	78	564	17:46	2	0.874	A BB	16024.	0.702 UG/L	0.14
23	NOT FOUND								
24	63	645	20:19	2	1.000	A BB	224480.	223.215 UG/L	44.32
25	NOT FOUND								
26	NOT FOUND								
27	NOT FOUND								
28	91	771	24:17	3	0.960	A BB	80.	0.003 UG/L	0.00
29	NOT FOUND								
30	NOT FOUND								
31	NOT FOUND								
32	65	403	12:42	1	1.275	A BB	222366.	44.627 UG/L	8.86
33	98	765	24:06	3	0.953	A BB	1755020.	54.205 UG/L	10.76
34	95	970	30:33	3	1.208	A BB	849372.	52.147 UG/L	10.35

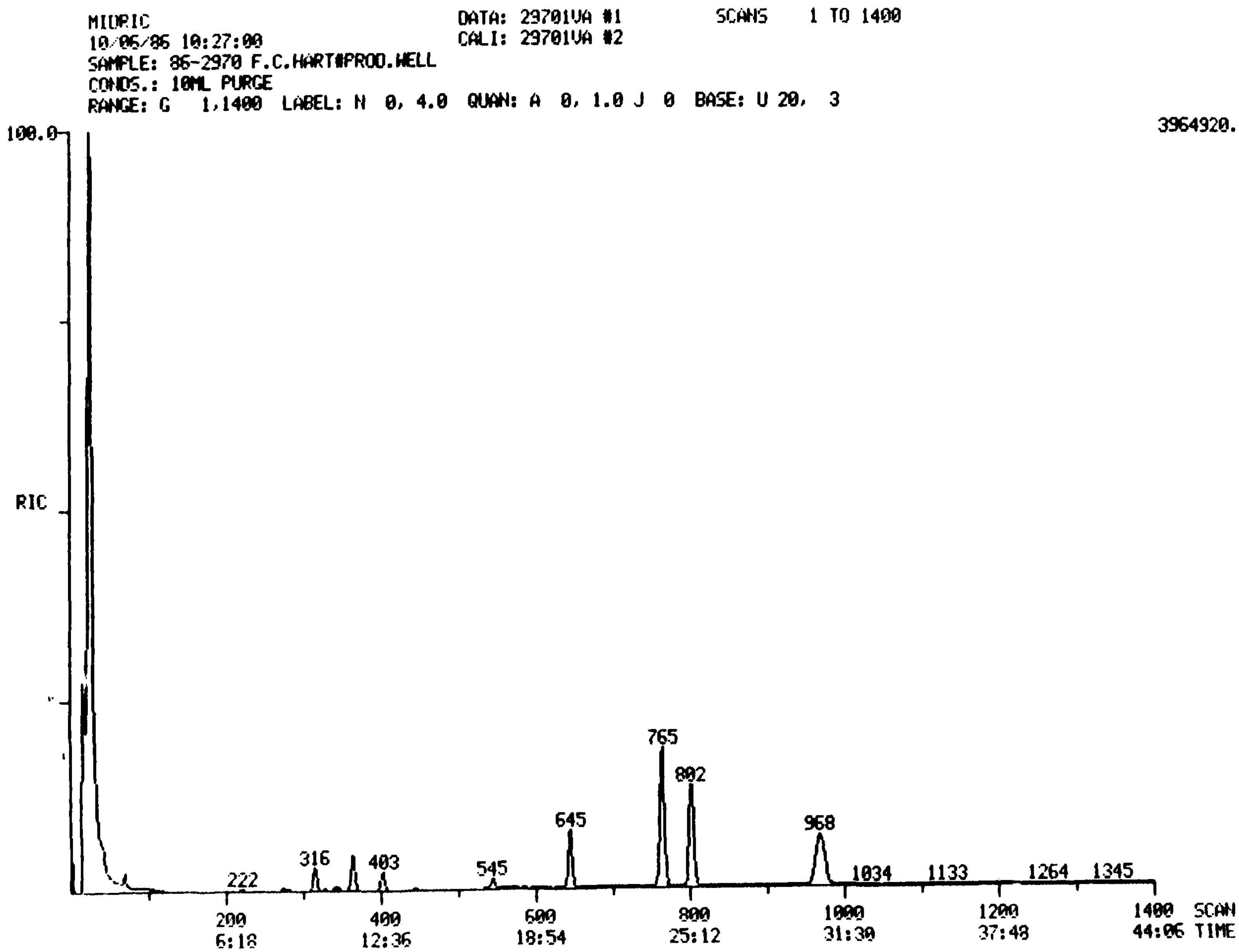
No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	9:46	1.02	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	20:06	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	25:03	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	1:44		0.177						
5	2:52		0.294						
6	3:41		0.377						
7	4:43		0.484						
8	6:46	1.03	0.694	1.01	6.57	200.00	0.006	0.181	0.03
9	11:20	1.01	1.161	0.99	0.27	200.00	0.001	0.440	0.00
10	10:37	1.02	1.087	1.00	0.02	200.00	0.000	0.922	0.00
11	11:20	1.01	1.161	0.99	0.27	200.00	0.001	0.440	0.00
12	11:49		1.210						
13	12:34		1.287						
14	13:52	1.01	0.690	1.00	0.06	200.00	0.000	0.247	0.00
15	14:14		0.708						
16	14:41		0.730						
17	16:08		0.803						
18	16:21		0.813						
19	16:57	1.01	0.843	1.00	1.86	200.00	0.004	0.388	0.01
20	17:25		0.867						
21	17:35		0.875						
22	17:31	1.01	0.871	1.00	0.70	200.00	0.005	1.330	0.00
23	17:37		0.876						
24	20:06	1.01	1.000	1.00	223.22	200.00	0.066	0.059	1.12
25	20:06		1.000						
26	22:39		0.904						
27	22:28		0.897						
28	24:02	1.01	0.960	1.00	0.00	200.00	0.000	1.020	0.00
29	25:10		1.005						
30	27:21		1.092						
31	33:23		1.333						
32	12:28	1.02	1.277	1.00	44.63	50.00	0.668	0.749	0.89
33	23:51	1.01	0.952	1.00	54.20	50.00	1.468	1.354	1.08
34	30:09	1.01	1.204	1.00	52.15	50.00	0.710	0.681	1.04

MIDRIC
10/06/86 9:25:00
SAMPLE: 86-2970 F.C.HART#SW-3
CONDS.: 10ML PURGE
RANGE: G 1,1400 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: 29702U #1
CALI: 29702U #2

SCANS 1 TO 1400




MIDRIC
10/06/86 10:27:00
SAMPLE: 86-2970 F.C.HART#PROD.WELL
CONDS.: 10ML PURGE
RANGE: G 1,1400 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3
DATA: 29701VA #1
CALI: 29701VA #2
SCANS 1 TO 1400
3964920.
100.0
RIC
222
316
403
545
645
765
802
968
1034
1133
1264
1345
200 6:18
400 12:36
600 18:54
800 25:12
1000 31:30
1200 37:48
1400 44:06
SCAN
TIME

APPENDIX H.5

OTHER AFP 59 ANALYTICAL RESULTS

(CL5121A)

H.5-1

OBRIEN & GERE

Purgeable Priority Pollutants

CLIENT GENERAL ELECTRIC Westover JOB NO. 2672.008.517

DESCRIPTION Well

SAMPLE NO. 84122 DATE COLLECTED 5-23-85 DATE REC'D. 5-24-85 DATE ANALYZED 6-5-85

	ppb		ppb
Chloromethane	< 1.	1,2-Dichloropropane	< 1.
Bromomethane		t-1,3-Dichloropropene	< 1.
Dichlorodifluoromethane		Trichloroethene	5.
Vinyl chloride		Benzene	< 1.
Chloroethane		Dibromochloromethane	
Methylene chloride		1,1,2-Trichloroethane	
Trichlorofluoromethane		c-1,3-Dichloropropene	
1,1-Dichloroethene		2-Chloroethylvinyl ether	<10.
1,1-Dichloroethane	11.	Bromoform	<10.
t-1,2-Dichloroethene	37.	1,1,2,2-Tetrachloroethane	< 1.
Chloroform	< 1.	Tetrachloroethene	
1,2-Dichloroethane	< 1.	Toluene	
1,1,1-Trichloroethane	2.	Chlorobenzene	
Carbon tetrachloride	< 1.	Ethylbenzene	
Bromodichloromethane	< 1.		

Methodology: Federal Register — 40 CFR, Part 136, December 3, 1979

Comments:

Freon 113	2.
Temperature, Field	22°C
pH, Field	7.7

Authorized: [signature]

Date: 6/22/85

O'Brien & Gere Engineers, Inc.
Box 4873 1304 Buckley Rd Syracuse NY 13221 (315) 451-4700

OBRIEN & GERE

Purgeable Priority Pollutants

CLIENT GENERAL ELECTRIC COMPANY JOB NO. 2672.008.517

DESCRIPTION Well Site

SAMPLE NO. 30861 DATE COLLECTED 2-12-85 DATE REC'D. 2-12-85 DATE ANALYZED 2-13-85

	ppb		ppb
Chloromethane	<1.	1,2-Dichloropropane	<1.
Bromomethane		t-1,3-Dichloropropene	<1.
Dichlorodifluoromethane		Trichloroethene	8.
Vinyl chloride		Benzene	<1.
Chloroethane		Dibromochloromethane	
Methylene chloride		1,1,2-Trichloroethane	
Trichlorofluoromethane		c-1,3-Dichloropropene	
1,1-Dichloroethene		2-Chloroethylvinyl ether	<10.
1,1-Dichloroethane	11.	Bromoform	<10.
t-1,2-Dichloroethene	63.	1,1,2,2-Tetrachloroethane	<1.
Chloroform	<1.	Tetrachloroethene	
1,2-Dichloroethane	<1.	Toluene	
1,1,1-Trichloroethane	3.	Chlorobenzene	
Carbon tetrachloride	<1.	Ethylbenzene	
Bromodichloromethane	<1.		

Methodology: Federal Register — 40 CFR, Part 136, December 3, 1979

Comments:

Freon 113 5.

Authorized: [signature]

Date: 2-15-85

O'Brien & Gere Engineers, Inc.
Box 4873 1304 Buckley Rd Syracuse NY 13221 (315) 451-4700

OBRIEN & GERE

Laboratory Report

CLIENT GENERAL ELECTRIC, Johnson City JOB NO. 2672.008.517

DESCRIPTION Well Water

DATE COLLECTED 2-7-85 DATE REC'D 2-7-85 DATE ANALYZED

SAMPLE		27795				
Antimony	SB	< 0.1				
Arsenic	AS	< 0.01				
Beryllium	BE	< 0.01				
Cadmium	CD	< 0.01				
CHromium	CR	< 0.01				
Copper	CU	< 0.01				
Lead	PB	< 0.01				
Mercury	HG	< 0.0005				
Nickel	NI	0.03				
Selenium	SE	< 0.01				
Silver	AG	< 0.01				
Thellium	TL	< 1.				
Zinc	ZN	< 0.01				
Cyanide	CN	< 0.05				
Total Phenols	PHENOL	< 0.001				

Methodology: Federal Register — 40 CFR, Part 136, December 3, 1979

Units: mg/ℓ (ppm) unless otherwise noted

Comments:

Authorized: ECT

Date: 5/28/85

O'Brien & Gere Engineers, Inc.
Box 4873 / 1304 Buckley Rd. / Syracuse, NY / 13221 / (315) 451-4700

O'BRIEN & GERE

Pesticide/PCB Priority Pollutants

CLIENT GENERAL ELECTRIC, Johnson City JOB NO. 2672.008.517

DESCRIPTION Well Water

SAMPLE NO. 27795 DATE COLLECTED 2-7-85 DATE REC'D. 2-7-85 DATE ANALYZED 2-25-85

	ppb		ppb
α-BHC	< 0.1	Endosulfan II	< 0.1
γ-BHC	< 0.1	4,4'-DDT	< 0.5
β-BHC	< 0.1	Endosulfan Sulfate	< 0.5
Heptachlor	< 0.1	Endrin Aldehyde	< 0.5
δ-BHC	< 0.1	Chlordane	< 1.0
Aldrin	< 0.1	Toxaphene	< 5.0
Heptachlor Epoxide	< 0.1	PCB-1221	< 1.0
Endosulfan I	< 0.1	PCB-1232	< 1.0
4,4'-DDE	< 0.1	PCB-1016/1242	< 1.0
Dieldrin	< 0.1	PCB-1248	< 1.0
Endrin	< 0.1	PCB-1254	< 1.0
4,4'-DDD	< 0.5	PCB-1260	< 1.0

Methodology: Federal Register — 40 CFR, Part 136, December 3, 1979

Comments:

Methoxyclor < 0.5

O'Brien & Gere Engineers Inc
Box 4873 1304 Buckley Rd Syracuse NY 13221 (315) 451-4700

Authorized: [illegible]

Date: [illegible]

H.5-5

O'BRIEN & GERE

Acid Priority Pollutants

CLIENT GENERAL ELECTRIC, Johnson City JOB NO. 2672.008.517

DESCRIPTION Well Water

SAMPLE NO. 27795 DATE COLLECTED 2-7-85 DATE REC'D. 2-7-85 DATE ANALYZED 4-29-85

	ppb		ppb
2-Chlorophenol	< 25	2,4,6-Trichlorophenol	< 25
2-Nitrophenol	< 25	4-Chloro-3-methylphenol	< 25
Phenol	< 25	2,4-Dinitrophenol	< 25
2,4-Dimethylphenol	< 25	2-Methyl-4,6-dinitrophenol	< 250
2,4-Dichlorophenol	< 25	Pentachlorophenol	< 250
		4-Nitrophenol	< 250

Methodology: Federal Register — 40 CFR, Part 136, December 3, 1979

Comments:

O'Brien & Gere Engineers, Inc.
Box 4873 / 1304 Buckley Rd / Syracuse, NY / 13221 / (315) 451-4700

Authorized: ECT [illegible]

Date: 5/24/85

OBRIEN & GERE

Base/Neutral Priority Pollutants

CLIENT GENERAL ELECTRIC, Johnson City JOB NO. 2672.008.517

DESCRIPTION Well Water

SAMPLE NO. 27795 DATE COLLECTED 2-7-85 DATE REC'D. 2-7-85 DATE ANALYZED 4-29-85

	ppb		ppb
1,3-Dichlorobenzene	< 10	Diethylphthalate	< 10
1,4-Dichlorobenzene	< 10	N-nitrosodiphenylamine	< 10
1,2-Dichlorobenzene	< 10	Hexachlorobenzene	< 10
Hexachloroethane	< 10	4-Bromophenyl phenyl ether	< 10
Bis (2-chloroethyl) ether	< 10	Phenanthrene	< 10
Bis (2-chloroisopropyl) ether	< 10	Anthracene	< 10
N-Nitrosodi-n-propylamine	< 10	Di-n-butyl phthalate	< 10
Nitrobenzene	< 10	Fluoranthene	< 10
Hexachlorobutadiene	< 10	Pyrene	< 10
1,2,4-Trichlorobenzene	< 10	Benzidine	< 10
Isophorone	< 10	Butyl benzyl phthalate	< 10
Naphthalene	< 10	Bis(2-ethylhexyl)phthalate	< 10
Bis (2-chloroethoxy) methane	< 10	Chrysene	< 10
Hexachlorocyclopentadiene	< 10	Benzo(a)anthracene	< 10
2-Chloronaphthalene	< 10	3,3-Dichlorobenzidine	< 10
Acenaphthylene	< 10	Di-n-octylphthalate	< 10
Acenaphthene	< 10	Benzo(b)fluoranthene	< 10
Dimethyl phthalate	< 10	Benzo(k)fluoranthene	< 10
2,6-Dinitrotoluene	< 10	Benzo(a)pyrene	< 10
Fluorene	< 10	Indeno(1,2,3-cd)pyrene	< 25
4-Chlorophenyl phenyl ether	< 10	Dibenzo(a,h)anthracene	< 25
2,4-Dinitrotoluene	< 10	Benzo(g,h,i)perylene	< 25
1,2-Diphenylhydrazine	< 10	N-Nitrosodimethyl Amine	< 10

Methodology: Federal Register — 40 CFR, Part 136, December 3, 1979

Comments:

Authorized: GCT [signature]

Date: 5/29/85

O'Brien & Gere Engineers, Inc
Box 4873 / 1304 Buckley Rd / Syracuse, NY / 13221 / (315) 451-4700

H.5-7

RECEIVED DEC 6 198

princeton testing laboratory

DATE: November 25, 1985

JOB NO. 41458

AUTHORIZATION: Project G 106

SAMPLE: Water - 1

TO:

Fred C. Hart
530 Fifth Ave.
New York, NY 10036

Att: Rob Goldman

REPORT OF ANALYSIS

	SUPPLY WELL
	mg/1
Oil & Grease	< .5
TOC	<2.0
pH	7.35
Specific Conductivity	730

TOX (micrograms per liter) 13

MDL - 10 " " "

Rec'd. 11/1/85

Edna A. Alinea

Edna A. Alinea, Manager
Water, Waste Water & Microbiology

William F Pickup Director

EAA/rk

< - less than < ND - element is less than the value given and not detected by the technique employed > - greater than ND - not detected

APPENDIX H.6

ANALYTICAL RESULTS FROM WELLS IN SURROUNDING AREA

(CL5121A)

RECEIVED DEC 31 1986 H.6-1

Broome County
Memorandum

To: Vanessa DeVillez
From: Tony Mastrangelo AMM/KLS
Date: December 23, 1986
Subject: Johnson City (V) Water Supply

Enclosed are results of organic, inorganic, trihalomethane, and pesticide/herbicide sampling during the past three years as requested on December 17, 1986.

I have also included a copy of the sole source aquifer determination for the Clinton Street - Ballpark Aquifer in the Federal Register.

If you have any additional information, feel free to call this department at (607) 772-2887.

AMM:kls

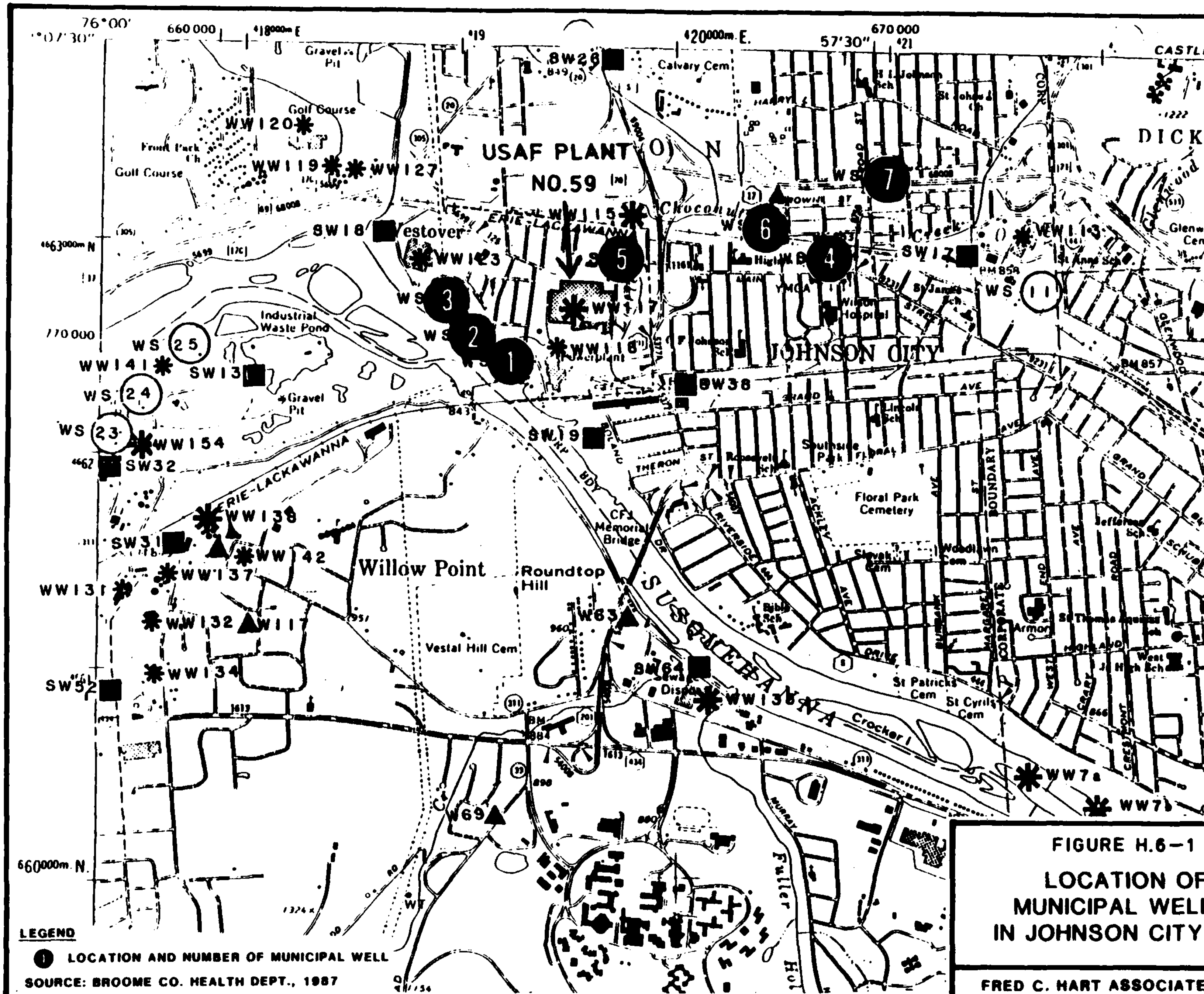


FIGURE H.6–1

LOCATION OF MUNICIPAL WELLS IN JOHNSON CITY, NY

FRED C. HART ASSOCIATES, INC.

H2M

HOLZMACHER, McLENDON and MURRELL, P.C • CONSULTING ENGINEERS, ENVIRONMENTAL SCIENTISTS and PLANNERS
575 BROAD HOLLOW ROAD, MELVILLE, N.Y. 11747 • 516-694-3040

Broome County Health Dept.
1 Wall Street
Binghamton, NY 13901

Sample Lab No. 662108
Date Collected: 10/16/86
Date Received: 10/17/86
Type: Potable Water
Point: Sta. #2-Johnson City Well #7
Collected By: DA 99

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BROOME COUNTY
HEALTH DEPARTMENT

RESULTS FOR VOLATILE HALOGENATED ORGANICS

Compound	ug/l
vinyl chloride	< 1
dichlorodifluoromethane	< 1
methylene chloride	< 1
trichlorofluoromethane	< 1
1,1-dichloroethylene	< 1
1,1-dichloroethane	< 1
trans-1,2-dichloroethylene	< 1
cis-1,2-dichloroethylene	< 1
chloroform	< 1
1,1,2-trichlorotrifluoroethane	< 1
1,2-dichloroethane	< 1
1,1,1-trichloroethane	< 3
carbon tetrachloride	< 1
bromodichloromethane	< 1
1,2-dichloropropane	< 1
2,3-dichloropropene	< 1
trans-1,3-dichloropropene	< 1
trichloroethylene	< 1
1,1,2-trichloroethane	< 1
chlorodibromomethane	< 1
cis-1,3-dichloropropene	< 1
bromoform	< 1
1,1,1,2-tetrachloroethane	< 1
tetrachloroethylene	< 1
1,1,2,2-tetrachloroethane	< 1
chlorobenzene	< 1
VOLATILE NON-HALOGENATED ORGANICS	
benzene	< 1
toluene	< 1
ethylbenzene	< 1
p-xylene	< 1
o-xylene	< 1
m-xylene	< 1

Results reported meet
N.Y.S. Drining Water Limits.
Date Reported: 11/3/86

S.C. McLendon, P.E.
Laboratory Director

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Broome County Health Dept.
1 Wall Street
Binghamton, NY 13901

Sample Lab No. 662107
Date Collected: 10/16/86
Date Received: 10/17/86
Type: Potable Water
Point: Sta. #1 - Johnson city well #2 - 0940 Hrs.
Collected By: DA 99

RESULTS FOR VOLATILE HALOGENATED ORGANICS

Compound	ug/l
vinyl chloride	< 1
dichlorodifluoromethane	< 1
methylene chloride	< 1
trichlorofluoromethane	< 1
1,1-dichloroethylene	< 1
1,1-dichloroethane	< 1
trans-1,2-dichloroethylene	< 1
cis-1,2-dichloroethylene	< 1
chloroform	< 1
1,1,2-trichlorotrifluoroethane	< 1
1,2-dichloroethane	< 1
1,1,1-trichloroethane	< 3
carbon tetrachloride	< 1
bromodichloromethane	< 1
1,2-dichloropropane	< 1
2,3-dichloropropene	< 1
trans-1,3-dichloropropene	< 1
trichloroethylene	< 1
1,1,2-trichloroethane	< 1
chlorodibromomethane	< 1
cis-1,3-dichloropropene	< 1
bromoform	< 1
1,1,1,2-tetrachloroethane	< 1
tetrachloroethylene	< 1
1,1,2,2-tetrachloroethane	< 1
chlorobenzene	< 1
VOLATILE NON-HALOGENATED ORGANICS	
benzene	< 1
toluene	< 1
ethylbenzene	< 1
p-xylene	< 1
o-xylene	< 1
m-xylene	< 1

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Results reported meet
N.Y.S. Drining Water Limits.
Date Reported: 11/3/86

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Laboratory Director

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Broome County Health Dept.
1 Wall Street
Binghamton, NY 13901

Sample Lab No. 661808
Date Collected: 10/7/86
Date Received: 10/9/86
Type: Potable Water
Point: Sta. #3 - Johnson City well #3 - 1030 Hrs.
Collected By: TMM 99

RESULTS FOR VOLATILE HALOGENATED ORGANICS

Compound	ug/l
vinyl chloride	< 1
dichlorodifluoromethane	< 1
methylene chloride	< 1
trichlorofluoromethane	< 1
1,1-dichloroethylene	1
1,1-dichloroethane	< 1
trans-1,2-dichloroethylene	< 1
cis-1,2-dichloroethylene	< 1
chloroform	< 1
1,1,2-trichlorotrifluoroethane	< 1
1,2-dichloroethane	< 1
1,1,1-trichloroethane	< 9
carbon tetrachloride	< 1
bromodichloromethane	< 1
1,2-dichloropropane	< 1
2,3-dichloropropene	< 1
trans-1,3-dichloropropene	< 1
trichloroethylene	< 1
1,1,2-trichloroethane	< 1
chlorodibromomethane	< 1
cis-1,3-dichloropropene	< 1
bromoform	< 1
1,1,1,2-tetrachloroethane	< 1
tetrachloroethylene	< 1
1,1,2,2-tetrachloroethane	< 1
chlorobenzene	< 1
VOLATILE NON-HALOGENATED ORGANICS	
benzene	< 1
toluene	< 1
ethylbenzene	< 1
p-xylene	< 1
o-xylene	< 1
m-xylene	< 1

Results reported meet
N.Y.S. Drinking Water Limits.
Date Reported: 11/4/86

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Broome County Health Dept.
1 Wall Street
Binghamton, NY 13901

Sample Lab No. 661809
Date Collected: 10/7/86
Date Received: 10/9/86
Type: Potable Water
Point: Sta. #4 - Johnson City well #6 - 1100 Hrs.
Collected By: TMM 99

RESULTS FOR VOLATILE HALOGENATED ORGANICS

Compound	ug/l
vinyl chloride	< 1
dichlorodifluoromethane	< 1
methylene chloride	< 1
trichlorofluoromethane	< 1
1,1-dichloroethylene	1
1,1-dichloroethane	< 1
trans-1,2-dichloroethylene	< 1
cis-1,2-dichloroethylene	< 1
chloroform	< 1
1,1,2-trichlorotrifluoroethane	< 1
1,2-dichloroethane	< 1
1,1,1-trichloroethane	< 8
carbon tetrachloride	< 1
bromodichloromethane	< 1
1,2-dichloropropane	< 1
2,3-dichloropropene	< 1
trans-1,3-dichloropropene	< 1
trichloroethylene	< 1
1,1,2-trichloroethane	< 1
chlorodibromomethane	< 1
cis-1,3-dichloropropene	< 1
bromoform	< 1
1,1,1,2-tetrachloroethane	< 1
* tetrachloroethylene	1
1,1,2,2-tetrachloroethane	
chlorobenzene	< 1
VOLATILE NON-HALOGENATED ORGANICS	
benzene	< 1
toluene	< 1
ethylbenzene	< 1
p-xylene	< 1
o-xylene	< 1
m-xylene	< 1

Results reported meet
N.Y.S. Drinking Water Limits.
Date Reported: 11/4/86

* Reported value represents total.

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Broome County Health Dept.
1 Wall Street
Binghamton, NY 13901

Sample Lab No. 657146
Date Collected: 6/25/86
Date Received: 6/26/86
Type: Potable Water
Point: Johnson City Well #3   Taken @ 1345 Hrs.
Collected By: TM 99   Raw tap at wellhouse

RESULTS FOR VOLATILE HALOGENATED ORGANICS

Compound	ug/l
vinyl chloride	< 1
dichlorodifluoromethane	< 1
methylene chloride	< 1
trichlorofluoromethane	< 1
1,1-dichloroethylene	< 1
1,1-dichloroethane	1
* trans-1,2-dichloroethylene / cis-1,2-dichloroethylene	2
chloroform	< 1
1,1,2-trichlorotrifluoroethane	< 1
1,2-dichloroethane	< 1
1,1,1-trichloroethane	< 1
carbon tetrachloride	< 1
bromodichloromethane	< 1
1,2-dichloropropane	< 1
2,3-dichloropropene	< 1
trans-1,3-dichloropropene	< 1
trichloroethylene	< 1
1,1,2-trichloroethane	< 1
chlorodibromomethane	< 1
cis-1,3-dichloropropene	< 1
bromoform	< 1
1,1,1,2-tetrachloroethane	< 1
tetrachloroethylene	< 1
1,1,2,2-tetrachloroethane	< 1
chlorobenzene	< 1
VOLATILE NON-HALOGENATED ORGANICS	
benzene	< 1
toluene	< 1
ethylbenzene	< 1
p-xylene	< 1
o-xylene	< 1
m-xylene	< 1

Results reported meet N.Y.S.
Drinking Water Limits.
Date Reported: 7/16/86

* Reported value represents total.

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CLIENT NAME AND ADDRESS

Broome County Health Dept.
1 Wall Street
Binghamton, NY 13901

Lab. No. 556812
Type Water Potable Water
Sampling Pt. Johnson City Well #2
Treated @ Well 1020 Hrs.
Date Sampled 6/4/85
Collected By CL 99

VOLATILE HALOGENATED	ug/l
vinyl chloride	< 1
dichlorodifluoromethane	< 1
methylene chloride	< 1
trichlorofluoromethane	< 1
1,1-dichloroethylene	< 1
1,1-dichloroethane	< 1
trans-1,2-dichloroethylene	< 1
cis-1,2-dichloroethylene	< 1
chloroform	< 1
1,1,2-trichlorotrifluoroethane	< 1
1,2-dichloroethane	< 1
1,1,1-trichloroethane	< 1
carbon tetrachloride	< 1
bromodichloromethane	< 1
1,2-dichloropropane	< 1
2,3-dichloropropene	< 1
trans-1,3-dichloropropene	< 1
trichloroethylene	< 1
1,1,2-trichloroethane	< 1
chlorodibromomethane	< 1
cis-1,3-dichloropropene	< 1
bromoform	< 1
1,1,1,2-tetrachloroethane	< 1
tetrachloroethylene	< 1
1,1,2,2-tetrachloroethane	< 1
chlorobenzene	< 1
VOLATILE NON-HALOGENATED	
benzene	< 1
toluene	< 1
ethylbenzene	< 1
m-xylene	< 1
o-xylene	< 1
p-xylene	< 1

* Reported value represents total.
Results reported meet N.Y.S.
Drinking Water Limits.

Date Reported: 6/17/85

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Laboratory Director

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CLIENT NAME AND ADDRESS

Broome County Health Dept.
1 Wall St.
Binghamton, NY 13901

Lab. No. 556813
Type Water Potable Water
Sampling Pt. Johnson City Well #1
Treated @ Well 1025 Hrs.
Date Sampled 6/4/85
Collected By CL 99

VOLATILE HALOGENATED	ug/l
vinyl chloride	< 1
dichlorodifluoromethane	< 1
methylene chloride	< 1
trichlorofluoromethane	< 1
1,1-dichloroethylene	< 1
1,1-dichloroethane	< 1
trans-1,2-dichloroethylene	< 1
cis-1,2-dichloroethylene	< 1
chloroform	< 1
1,1,2-trichlorotrifluoroethane	< 1
1,2-dichloroethane	< 1
1,1,1-trichloroethane	< 3
carbon tetrachloride	< 1
bromodichloromethane	< 1
1,2-dichloropropane	< 1
2,3-dichloropropene	< 1
trans-1,3-dichloropropene	< 1
trichloroethylene	< 1
1,1,2-trichloroethane	< 1
chlorodibromomethane	< 1
cis-1,3-dichloropropene	< 1
bromoform	< 1
1,1,1,2-tetrachloroethane	< 1
tetrachloroethylene	< 1
1,1,2,2-tetrachloroethane	< 1
chlorobenzene	< 1
VOLATILE NON-HALOGENATED	
benzene	< 1
toluene	< 1
ethylbenzene	< 1
m-xylene	< 1
o-xylene	< 1
p-xylene	< 1

* Reported value represents total.
Results reported meet N.Y.S.
Drinking Water Limits.

Date Reported: 6/17/85

S.C. McLendon, P.E.
Laboratory Director

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CLIENT NAME AND ADDRESS

Broome County Health Dept.
1 Wall St.
Binghamton, NY 13901

Lab. No. 556814
Type Water Potable Water
Sampling Pt. Johnson City Well #6
Treated @ Well 1100 Hrs.
Date Sampled 6/4/85
Collected By Cl 99

VOLATILE HALOGENATED	ug/l
vinyl chloride	< 1
dichlorodifluoromethane	< 1
methylene chloride	< 1
trichlorofluoromethane	< 1
1,1-dichloroethylene	< 1
1,1-dichloroethane	< 1
trans-1,2-dichloroethylene	< 1
cis-1,2-dichloroethylene	< 1
chloroform	< 1
1,1,2-trichlorotrifluoroethane	< 1
1,2-dichloroethane	< 1
1,1,1-trichloroethane	< 1
carbon tetrachloride	< 1
bromodichloromethane	< 1
1,2-dichloropropane	< 1
2,3-dichloropropene	< 1
trans-1,3-dichloropropene	< 1
trichloroethylene	< 1
1,1,2-trichloroethane	< 1
chlorodibromomethane	< 1
cis-1,3-dichloropropene	< 1
bromoform	< 1
1,1,1,2-tetrachloroethane	< 1
tetrachloroethylene	< 1
1,1,2,2-tetrachloroethane	< 1
chlorobenzene	< 1
VOLATILE NON-HALOGENATED	
benzene	< 1
toluene	< 1
ethylbenzene	< 1
m-xylene	< 1
o-xylene	< 1
p-xylene	< 1

* Reported value represents total.
Results reported meet N.Y.S. Drinking Water Limits.

Date Reported: 6/17/85

S.C. McLendon, P.E.
Laboratory Director

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CLIENT NAME AND ADDRESS

Broome County Health Dept.
1 Wall St.
Binghamton, NY 13901

Lab. No. 556657
Type Water Potable Water
Sampling Pt. Vill. of Johnson City - Well #7
Treated Water Tap in Well house - Taken @ 1329 Hrs.
Date Sampled 5/30/85
Collected By CL 99

VOLATILE HALOGENATED	ug/1
vinyl chloride	< 1
dichlorodifluoromethane	< 1
methylene chloride	< 1
trichlorofluoromethane	< 1
1,1-dichloroethylene	< 1
1,1-dichloroethane	< 1
trans-1,2-dichloroethylene	< 1
cis-1,2-dichloroethylene	< 1
chloroform	< 1
1,1,2-trichlorotrifluoroethane	< 1
1,2-dichloroethane	< 1
1,1,1-trichloroethane	< 2
carbon tetrachloride	< 1
bromodichloromethane	< 1
1,2-dichloropropane	< 1
2,3-dichloropropene	< 1
trans-1,3-dichloropropene	< 1
trichloroethylene	< 1
1,1,2-trichloroethane	< 1
chlorodibromomethane	< 1
cis-1,3-dichloropropene	< 1
bromoform	< 1
1,1,1,2-tetrachloroethane	< 1
tetrachloroethylene	< 1
1,1,2,2-tetrachloroethane	< 1
chlorobenzene	< 1
VOLATILE NON-HALOGENATED	
benzene	< 1
toluene	< 1
ethylbenzene	< 1
m-xylene	< 1
o-xylene	< 1
p-xylene	< 1

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HEALTH DEPARTMENT

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Results reported meet N.Y.S.
Drinking Water Limits.

Date Reported: 6/10/85

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Laboratory Director

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CLIENT NAME AND ADDRESS

Broome County Health Dept.
1 Wall St.
Binghamton, NY 13901

Lab. No. 556656
Type Water Potable Water
Sampling Pt. Vill. of Johnson City Well #3
Treated Water Tap in Well House - Taken @ 1319 Hrs.

Date Sampled 5/30/85
Collected By CL 99

VOLATILE HALOGENATED	ug/l
vinyl chloride	< 1
dichlorodifluoromethane	< 1
methylene chloride	< 1
trichlorofluoromethane	< 1
1,1-dichloroethylene	< 1
1,1-dichloroethane	< 1
trans-1,2-dichloroethylene	< 1
cis-1,2-dichloroethylene	< 1
chloroform	< 1
1,1,2-trichlorotrifluoroethane	< 1
1,2-dichloroethane	< 1
1,1,1-trichloroethane	< 2
carbo.. tetrachloride	< 1
bromodichloromethane	< 1
1,2-dichloropropane	< 1
2,3-dichloropropene	< 1
trans-1,3-dichloropropene	< 1
trichloroethylene	< 1
1,1,2-trichloroethane	< 1
chlorodibromomethane	< 1
cis-1,3-dichloropropene	< 1
bromoform	< 1
1,1,1,2-tetrachloroethane	< 1
tetrachloroethylene	< 1
1,1,2,2-tetrachloroethane	< 1
chlorobenzene	< 1
VOLATILE NON-HALOGENATED	
benzene	< 1
toluene	< 1
ethylbenzene	< 1
m-xylene	< 1
o-xylene	< 1
p-xylene	< 1

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Results reported meet N.Y.S.
Drinking Water Limits.

Date Reported: 6/10/85

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Laboratory Director

H.6-12

OBG
LABORATORIES, INC.

Safe Drinking Water Act

CLIENT JOHNSON CITY WATER DEPARTMENT JOB NO. 2750.001.517

DESCRIPTION

DATE COLLECTED 8-12-86 DATE REC'D. 8-13-86 DATE ANALYZED 8-19-86

Trihalomethane Analysis

Description	Sample Number	Chloro-form (ppb)	Bromo-Dichloro-Methane (ppb)	Chloro-DiBromo-Methane (ppb)	Bromo-Form (ppb)
15 Riverside Drive	A2122	<1.	<1.	<1.	<1.
General Machine Shop	A2123	<1.	<1.	<1.	<1.
36 Penna Road	A2124	<1.	<1.	<1.	2.
IBM Field House	A2125	<1.	<1.	2.	2.
Blank	A2126	<1.	<1.	<1.	<1.

Methodology: Federal Register — 40 CFR, Part 141, November 29, 1979

Comments:

Authorized: *[signature]*

Date: August 28, 1986

OBG Laboratories, Inc.
Box 4942 / 1304 Buckley Rd. / Syracuse, NY / 13221 / (315) 457-1494

H.6-13

O'BRIEN & GERE

Safe Drinking Water Act

CLIENT: JOHNSON CITY   JOB NO. 2750.001.517

DESCRIPTION

DATE COLLECTED 8-6-85   DATE REC'D. 8-7-85   DATE ANALYZED 9-2-85

Trihalomethane Analysis, POTENTIAL

Description	Sample Number	Chloroform (ppb)	Bromo-Dichloro-Methane (ppb)	Chloro-DiBromo-Methane (ppb)	Bromo-Form (ppb)
IBM Field House	5032	9.	6.	6.	7.
15 Riverside Drive	5033	12.	9.	7.	5.
Gen. Machine Shop	5034	4.	5.	4.	3.
Hill Top Manor	5035	5.	4.	4.	9.

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Methodology: Federal Register, Vol. 44, No. 231, N[redacted]Oct.26,1984

Comments: All sites were dosed w[redacted] and after seven days, 14-15ppm was remaining.

Authorized: [signature]

Date: 9-16-85

O'Brien & Gere Engineers, Inc.
Box 4873 / 1304 Buckley Rd. / Syracuse, NY / 13221 / (315) 451-4700

H.6-14

O'BRIEN & GERE

Safe Drinking Water Act

CLIENT JOHNSON CITY JOB NO. 2750.001.517

DESCRIPTION

DATE COLLECTED 11-11-83 DATE REC'D. 11-16-83 DATE ANALYZED 11-22-83

Trihalomethane Analysis Description	Sample Number	Chloroform (ppb)	Bromo-Dichloro-Methane (ppb)	Chloro-DiBromo-Methane (ppb)	Bromo-Form (ppb)
Instantaneous:					
Gen. Mach. Shop	71222	<1.	<1.	<1.	<1.
Schusters Big M	71223	<1.	<1.	1.	<1.
IBM	71224	<1.	<1.	2.	<1.
Hill Top	71225	<1.	<1.	<1.	3.
Field Blank	71226	<1.	<1.	<1.	<1.
Terminal: (MTP)					
Main Plant #2 Well	71227	15.	11.	4.	<1.
#6 Pump Station	71228	6.	6.	2.	<1.
chlorine residual after 7 days					
Main plant #2 23 ppm					
#6 pump station 21 ppm					

Methodology: Federal Register, Vol. 44, No. 231, November 29, 1979, pg. 68672-68689

Comments:

Authorized: Dr. Hiel

Date: 12-7-83

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Safe Drinking Water Act

CLIENT JOHNSON CITY JOB NO. 2750.001.517

DESCRIPTION

DATE COLLECTED 6-14-83 DATE REC'D. 6-15-83 DATE ANALYZED 6-21-83

Trihalomethane Analysis

Description		Sample Number	Chloroform (ppb)	Bromo-Dichloro-Methane (ppb)	Chloro-DiBromo-Methane (ppb)	Bromo-Form (ppb)
Big M	Instantaneous	61430	<1.	<1.	<1.	3.
Gen.Mach.Shop	"	61431	<1.	<1.	<1.	3.
Hill Top	"	61432	<1.	<1.	<1.	5.
IBM C.C.	"	61433	<1.	1.	3.	5.
Well 3 before Cl	Terminal	61434	14.	11.	5.	<1.
Well 6 before Cl	" (MTP)	61435	8.	8.	4.	<1.

Methodology: Federal Register, Vol. 44, No 231, November 29, 1979, pg 68672-68689

Comments:

Authorized: DRHill

Date: 7-12-83

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NEW YORK STATE DEPARTMENT OF HEALTH H.6-16
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 1 RESULTS OF EXAMINATION FINAL REPORT

SAMPLE ID 63168 SAMPLE RECEIVED: 86/06/26/ CHARGE: 23.4
PROGRAM 100: MUNICIPAL WATER SUPPLIES
SOURCE ID 655000 DRAINAGE BASIN 06 GAZETTEER CODE: 0303
POLITICAL SUBDIVISION: JOHNSON CITY V. COUNTY: BROOME
LATITUDE LONGITUDE Z DIRECTION:
LOCATION JOHNSON CITY V
DESCRIPTION TAP AT WELLHOUSE
REPORTING LAB TOX: LAB FOR ORGANIC ANALYTICAL CHEMISTRY
TEST PATTERN XPESTH: ORGANOCHLORINE PESTICIDES & HERBICIDES
SAMPLE TYPE 000: RAW WATER
TIME OF SAMPLING: 86/06/25 13:45 DATE PRINTED: 86/07/30

ANALYSIS XPEST ORGANOCHLORINE PESTICIDES (DES 310-2)

PARAMETER		RESULT
T15709	HCH, ALPHA	< 0.04 MCG/L
T15809	HCH, BETA	< 0.04 MCG/L
T35609	HCH, GAMMA (LINDANE)	< 0.04 MCG/L
T16009	HCH, DELTA	< 0.04 MCG/L
T08009	HEPTACHLOR	< 0.05 MCG/L
T07709	ALDRIN	< 0.02 MCG/L
T08209	HEPTACHLOR EPOXIDE	< 0.05 MCG/L
T43309	ENDOSULFAN I	< 0.05 MCG/L
T14609	DDE - PARA, PARA	< 0.05 MCG/L
T08509	DIELDRIN	< 0.02 MCG/L
T08409	ENDRIN	< 0.02 MCG/L
T14909	DDD - PARA, PARA	< 0.05 MCG/L
T42409	ENDOSULFAN II	< 0.05 MCG/L
T57409	ENDRIN ALDEHYDE	< 0.02 MCG/L
T57309	ENDOSULFAN SULFATE	< 0.05 MCG/L
T14709	DDT - PARA, PARA	< 0.05 MCG/L
T08209	METHOXYCHLOR	< 1.0 MCG/L
T35509	TOXAPHENE	< 1.0 MCG/L
T08609	CHLORDANE	< 0.1 MCG/L

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HEALTH DEPARTMENT

ANALYSIS HERB HERBICIDES (DES 310-3)
DATE REPORTED: 86/07/09 REPORT MAILED OUT

PARAMETER		RESULT
T08809	2,4-D	< 0.5 MCG/L
T42509	SILVEX (2,4,5-TP)	< 0.1 MCG/L

**** CONTINUED ON NEXT PAGE ****

COPIES SENT TO: CO(1), RO(1), LPHE(2), FED(0), INFO-P(0), INFO-L(0)

DIRECTOR OF ENVIRONMENTAL SANITATION
BROOME COUNTY HEALTH DEPT.
1 WALL STREET
BINGHAMTON, N.Y. 13901

SUBMITTED BY: ALBECK

NEW YORK STATE DEPARTMENT OF HEALTH H.6-17
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 2 RESULTS OF EXAMINATION FINAL REPORT

SAMPLE ID 63188 SAMPLE RECEIVED: 8[illegible]/06/26/ CHARGE: 23 4[illegible]
POLITICAL SUBDIVISION: JOHNSON CITY V. COUNTY: BROOME
LOCATION: JOHNSON CITY V
TIME OF SAMPLING: 86/06/25 13:45 DATE PRINTED: 86/07/[illegible]

FOLLOWING PARAMETERS NOT PART OF TEST PATTERN

ANALYSIS AMA NITROGEN CONTAINING PESTICIDES (DES 310-23)
DATE REPORTED: 86/07/15 REPORT MAILED OUT

PARAMETER		RESULT
~~T86609~~	~~EPTC (EPTAM)~~	~~< 1. MCG/L~~
T88509	BUTYLATE (SUTAN)	< 1. MCG/L
T09609	TRIFLURALIN	< 1. MCG/L
~~T34209~~	~~ATRAZINE~~	~~< 1. MCG/L~~
T71909	DIAZINON (SPECTRACIDE)	< 1. MCG/L
T87309	ALACHLOR (LASSO)	< 1. MCG/L
~~T87909~~	~~METOLACHLOR (DUAL)~~	~~< 1. MCG/L~~
T92009	CHLORPYRIFOS (DURSBAN)	< 1. MCG/L
T03709	MALATHION	< 1. MCG/L
~~T59909~~	~~CYANAZINE (BLADEX)~~	~~< 1. MCG/L~~
T55609	AZINPHOS-METHYL (GUTHION)	< 1. MCG/L
T10309	ISOFENPHOS (OFTANOL)	< 1. MCG/L

ANALYSIS ADD-HERB ADDITIONAL HERBICIDES
DATE REPORTED: 86/07/15 REPORT MAILED OUT

PARAMETER		RESULT
T10009	PROMETON (PRAMITROL)	< 1. MCG/L
~~T12109~~	~~BROMACIL (HYVAR)~~	~~NA~~
T13009	GLYPHOSATE (ROUNDUP)	NA
T14009	DIURON (DREXEL)	NA

**** END OF REPORT ****

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AUG 6 1986
[illegible] COUNTY
[illegible] DEPARTMENT

H.6-18

file
plus

O'BRIEN & GERE

Safe Drinking Water Act

CLIENT JOHNSON CITY JOB NO. 2750.001.517

DESCRIPTION 44 Camden Street

SAMPLE NO. 41003 DATE COLLECTED 7-25-84 DATE REC'D. 7-26-84 DATE ANALYZED

Primary Inorganic Chemicals	ppm
Arsenic	<0.01
Barium	<0.1
Cadmium	<0.01
Chromium	<0.01
Fluoride	<0.1
Lead	<0.01
Mercury	<0.0005
Nitrate	0.11
Silver	<0.01
Selenium	<0.01

Secondary Inorganic Chemicals	ppm
Chloride	
Copper	
Iron	
Manganese	
Sodium	
Sulfate	
Zinc	
Corrosivity	

Organic Chemicals	ppb
Endrin	
Lindane	
Methoxychlor	
Toxaphene	
2, 4-D	
2, 4, 5-TP Silvex	

Methodology: Federal Register — 40 CFR, Part 136, December 3, 1979

Comments:

Authorized: D. R. Brondon

Date 8-24-84

APPENDIX I

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(CL5119A)
(01071-00-86007-00)

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USGS, Water Resources Data New York Water Year 1983, New York NY-83-3, 1983

APPENDIX J

BIOGRAPHIES OF KEY PERSONNEL

(0472n-32)

Robert D. Goldman

Fields of Competence

Hydrogeological investigations for groundwater contamination, soil and groundwater sampling, geophysical exploration for oil and gas, and well-site geology.

Experience Summary

Five years varied geologic, hydrogeologic, and geophysical experience, including hazardous waste site investigations involving development and installation of groundwater monitoring programs, geophysical applications and processing, and well-site geology.

Education

B.A., Geology, University of Colorado, Boulder, 1979

Key Projects

° Field team leader at Michigan Superfund site; responsible for groundwater sampling, monitoring well installation, installation and maintenance of long-term monitoring and supervision of general field activities.

° Responsible for three dimensional modeling of the groundwater flow at a Michigan Superfund site to design remedial activities, utilizing USGS 3D Finite Difference model.

° Field team leader for exploratory borehole program to determine extent of contamination from underground tanks at New Jersey factory.

° Manager of field operations for the remedial investigation of a lead and cadmium contamination problem from mine tailings in Aspen, Colorado. Study included soil sampling, test pit and borehole investigation, soils mapping, and surface water budget study.

° Assistant Project Manager for two NURE (National Uranium Resource Evaluation) contracts in the Mississippi Embayment. Work involved extensive research and field sampling of the groundwater and surface water distribution with emphasis on hydrochemical trends for mineral exploration.

° Development of groundwater monitoring programs for Phase II of the Air Force's Installation Restoration Program.

- Participated in the preparation of RCRA Part B permit applications for various facilities, including a land treatment facility and a sanitary landfill.
- Installation of groundwater monitoring well system in compliance with RCRA guidelines for Part B permit.
- Preparation of model to rank the degree of remedial action needed for 37 hazardous waste sites.
- Project geologist for numerous hydrogeologic investigations to monitor release from underground tanks.
- Site evaluation and design of an investigative sampling plan for determining the presence of hazardous waste contamination concerning an industrial plant closure.
- Interpreted seismic data in geologically complex onshore areas, including the Overthrust Belt, Paradox Basin and the Great Basin.
- Project geologist for Devonian shale degasification study in western New York. Responsible for site investigation, development of a drilling program and drilling prognoses of 15 wells.

Professional Affiliations

National Well Water Association (Association of Ground Water Scientists and Engineers)

James P. Mack

Fields of Competence

Geology; hydrogeology; water resources evaluation; groundwater monitoring programs; geophysical surveys; groundwater characterization; environmental impact statements and permits; groundwater remediation.

Experience Summary

Twelve years of hydrogeological experience including design of groundwater monitoring systems, hazardous waste site investigations, application of hazard ranking models, preparation of RCRA compliance plans, including monitoring, maintenance and contingency plans, and spill response plans.

Education

B.S., Geology, Waynesburg College, 1974
M.S., Geology, Adelphi University, 1980

Key Projects

- Conducted and supervised Phase II confirmation studies for the Air Force's Installation Restoration Program (IRP). This involved developing scopes of work, estimating costs, coordinating subcontractors, supervising field work, preparing draft and final reports and attending meetings.

- Conducted hydrogeologic investigations of landfills and soil contamination problems in Ohio, West Virginia, Connecticut New Jersey, New York, New Mexico, Maryland, Alabama and North Dakota.

- Prepared a draft Corrective Actions Permit Writers Manual for EPA. Manual specified techniques EPA permit writer could use to evaluate the effectiveness of proposed groundwater cleanup programs.

- Participated in the design of a groundwater monitoring system for a major hazardous waste disposal site near Niagara Falls, New York. Because of the unique characteristics of the hydrogeologic environment, a new design was developed for monitoring wells.

- Project Manager for a site investigation and remedial design at a location in Toledo, Ohio, where excessive chromium contamination had been discovered in low permeable clay soil. Work consisted of the construction of 9 test pits, approximately 40 test borings and collection of over 300 soil samples which were analyzed for total chromium, hexavalent chromium, EP Toxic chromium. Remedial option considered consisted of soil excavation, capping, monitoring and an area of limited use.

- Conducted extensive hydrogeologic field investigations at a hazardous waste disposal site near Baltimore, Maryland, including drilling of test borings, installation of monitoring wells, natural gamma logging, aquifer tests, groundwater flow analysis and an estimate of potential impacts.

- Prepared an off-site spill response plan for a hazardous waste processing facility near Chicago, Illinois. Included coordinating site personnel, contacting local emergency response agencies and establishing a sequence of procedures for corporate personnel in the event of a spill.

- Participated in several Initial Assessment Studies for the US Navy. He has prepared water resources, soils and geology sections for IASs for the Indian Head Naval Ordnance Station, Earl Naval Weapons Station, Patuxent River Naval Air Station, Mechanicsburg Ships Parts Control Center and the Davisville Construction Battalion Center. Collected available published and filed reports, conducted interviews with appropriate personnel, evaluated potential groundwater and surface water impacts from identified disposal areas and ranked designated sites according to the Navy ranking model.

- Prepared earth and water resources sections for major environmental impact statements on 201 Facilities Plans for large river basins in the Northeast and Puerto Rico. This work included an evaluation of the potential effects expanded suburban development may have on regional groundwater quality and quantity. Characterized existing hydrogeologic conditions, prepared hydrologic budgets, delineated productive aquifers, performed safe yield determinations and identified aquifer recharge areas.

- Performed a hydrogeological analysis of a proposed hazardous waste disposal site (for PCBs) in the Upper Hudson region of New York. This included an evaluation of the site for compliance with New York State and Federal Hazardous Waste Disposal Regulations, suitability of the leachate collection system and adequacy of the groundwater monitoring plan.

Professional Affiliations

National Well Water Associations

Publications

Mr. Mack prepared Earth & Water Resources sections for the following studies:

- Environmental Impact Statement on the 201 Facilities Plan for the Upper Passaic River Basin in New Jersey.

- Environmental Impact Statement on the 201 Facilities Plan for the Upper Rockaway River Basin, New Jersey.

- Environmental Impact Statement on the 201 Facilities Plan for the Lajas Valley, in Puerto Rico.

- Environmental Impact Statement on the 201 Facilities Plan for the Upper Hudson-Lake George Region in New York.

- Environmental Impact Statement on the Dredging and Upland Disposal of PCB-Laden River Bed Sediments in the Upper Hudson, Fort Edwards, New York.

"Potential Groundwater Contamination from Development at Various Densities at Elwood, New York." Town of Huntington, Department of Environmental Protection, Huntington, New York.

"Environmental Impact Statement on the Imperial Gardens Subdivision With Special Reference to Anticipated Groundwater Contamination, Commack, New York." Town of Huntington, Department of Environmental Protection, Huntington, New York.

"Monitoring, Maintenance and Contingency Plan for SCA Chemical Services, Inc., Model City, New York."

"Off-Site Spill Emergency Response Plan for SCA Chemical Services Chicago Facility."

"Phase I Field Investigations and Risk Assessment of the Solley Road Site."

Hydrogeology Assessment of the Laurel Park Landfill, Naugatuck, CT.

IAS Study, Naval Ordnance Station, Indian Head, Maryland.

IAS Study, Naval Weapons Station, Earl, New Jersey.

IAS Study, Naval Air Station, Patuxent River, Maryland.

IAS Study, Ships Parts Control Center, Mechanicsburg, Pennsylvania.

IAS Study, Construction Battalion Center, Davisville, Rhode Island.

Development of a Comprehensive Groundwater Monitoring System to Meet Federal and State Requirements.

Evaluating RCRA Corrective Actions Program.

Investigation and Corrective Action: How It Was Done at a Superfund Site in Connecticut.

"Equipment for Data Collection at Hazardous Wastes Sites - An Overview for Environmental Professionals" (with T.J. Morahan) in The Proceedings of the National Conference on Hazardous Wastes and Hazardous Materials, March 1986.

Jill F. Greenberg

Fields of Competence

Toxicology of environmental and occupational contaminants; industrial hygiene/health and safety procedures; solid waste, hazardous waste and hazardous materials management; receptor analysis; risk assessment; data collection and quality assurance/quality control procedures; environmental compliance audits.

Experience Summary

Five years of experience in reviewing, assessing and disseminating to the public and private sectors information on chemical substances regarding their chemical properties and toxicity; evaluation of epidemiologic data on animal and human carcinogens; preparation of public outreach programs; site investigation and development of remedial action plans for hazardous waste sites.

Education

B.S., Biological Sciences, State University of New York-Binghamton, 1977

M.P.H. Candidate, Environmental Sciences, Columbia University School of Public Health

Key Projects

- Responsible for the development and modification of interim status operating permits for the SCA Chemical Services, Inc., Model City facility. Reformatted and revised the closure and post-closure plan, closure cost estimates, personnel training plan, Part A hazardous waste permit application, and the monitoring, maintenance and contingency plan to meet RCRA and state requirements for container and bulk storage, tank operations, wastewater treatment, PCB storage, solvent recovery and secure landfills.

- Performed a technical review of the Record of Decision for the PRP committee of the McAdoo Associates site. Evaluated the validity of water quality criteria/maximum acceptable contaminant levels proposed by EPA for 23 organic compounds detected on-site and prepared a critique of risk assessment assumptions utilized by EPA in the ROD.

- Responsible for the preparation and development of a guidance document on hazardous materials management for the fixed base operator/air taxi industry. Environmental compliance management areas covered included operational and procedural guidelines for storage and handling of flammable/combustible liquids, acids and

compressed gases, hazardous substance release reporting and federal, state and local hazard communication/right-to-know legislation.

- Conducted an environmental compliance audit and risk assessment of hazardous waste management facilities used by a Fortune 100 chemical company. Used quantitative ranking to define corporate liability under RCRA and CERCLA.

- Assisted in the development of an EPA Part B Permit Writer's Guidance Manual for Hazardous Waste Storage Tanks. Work included development of sections pertaining to operating procedures for tank systems that store or treat ignitable, reactive or incompatible wastes.

- Preparation of an Endangerment Assessment for a Superfund site in New Mexico where numerous volatile organics, such as toluene and 1,1,1-trichloroethane, and heavy metals, including chromium, nickel, lead and zinc, were detected in soil and groundwater. Work included development of aquatic, soil and airborne contaminant source-pathway-receptor analyses and an evaluation of laboratory QA/QC and reliability of analytical results.

- Prepared an Endangerment Assessment for a hazardous waste disposal site located in Delaware. Detailed toxicity profiles were developed for substances of concern, such as chromium, cadmium and ethylbenzene, and included identification of acute and chronic health risks and aquatic fate processes.

- Developed a hazard ranking system based on waste characteristics values for 22 organic and 18 inorganic compounds detected at 14 hazardous waste disposal sites of a Fortune 50 corporation in order to fulfill the requirements for an environmental liability audit. Substances of concern included heavy metals (chromium, lead), asbestos, inorganic acids, herbicides and organochlorine, organophosphate and carbamate insecticides.

- Developed the personnel training plan for the RCRA Part B permit application of a major New Jersey pharmaceutical manufacturing firm.

- Developed an extensive groundwater/surface water sampling plan for a long-term monitoring program at a Superfund site in Delaware as part of overall site QA/QC required by the remedial action workplan.

- Responsible for the classification and preparation of inventories on chemicals used in the semi-conductor industry, for compliance purposes under the OSHA Hazard Communication Standard and right-to-know training programs.

- Assisted in the development of RCRA Part B applications for the aqueous waste treatment and container storage facilities of a major automobile manufacturer in St. Louis, Missouri. Work included development of procedures to prevent hazards and an exposure assessment report for the regulated units at the facility. This included identification and assessment of source contaminants and potential exposure pathways.

- Assisted in a study of chemical exposures in the auto repair industry in the greater Metropolitan New York area. Developed a comprehensive manual for educational purposes.

- Completion of a nationwide review of state and local regulations pertaining to access to data on chemical composition and hazardous materials.

- Aided in the design and development of a new research technique and methodology for integrated pest management using the enzyme-lined immunosorbent assay.

- Served as an editor and writer for a national health publication, which focused on critical issues in the area of environmental and occupational health, with analyses of its effect on health policy.

- Aided in the preparation of reports for public dissemination concerning availability of epidemiologic data on humans exposed to animal carcinogens and other toxic substances, such as arsenic, 1,3-butadiene and ethylene dibromide.

- Developed an extensive plan of remedial action for homeowners concerned about health effects from exposure to chlordane and Dursban, pesticides used by commercial applicators for termite eradication.

- Coordinator and moderator of a seminar series for community organizations that provided scientific and technical information in areas of environmental and health policy. Responsible for overall evaluation of project, preparation of proceedings for publication and community outreach.

Professional Affiliations

American Public Health Association
Graduate Women in Science (AAAS)
Scientists Institute for Public Information

Publications

Greenberg, J., AirTran News, National Air Transportation Association, September 1986. Environmental Spotlight Column: "Shop Storage of Chemicals: Incidental Not Accidental."

Karstadt, M. and Greenberg, J., "Access to Data on Chemical Composition of Products Used in Auto Repair and Body Shops." Resurvey of Product Marketers (1985) (in preparation).

Karstadt, M. and Greenberg, J., "Access to Data on Chemical Composition of Products Used in Workplaces: Impact of the New York State Worker Right to Know Law (1985)" (in preparation).

Greenberg, J., 1982. "The Fight for Safety and Health at the Workplace." Consumer Health Perspectives, Volume VIII, No. 6, New York.

Greenberg, J., Editor, 1982. "Critical Issues in Workplace Health." Consumer Health Perspectives, Volume IX, No. 1, New York.

Langridge, W.H.R., Granados, R.R. and Greenberg, J.F., Journal of General Virology, 1981, Volume 54, pp. 443-448. "Detection of Baculovirus Protein in Cell Culture and Insect Larvae by Enzyme-linked Immunosorbent Assay (ELISA)."

Langridge, W.H.R. and Greenberg, J.F., Journal of General Virology, 1981, Volume 57, pp. 215-219. "Detection of Entomopoxvirus Proteins in Insect Cell Culture by Enzyme-linked Immunosorbent Assay (ELISA)."

Langridge, W.H.R., Granados, R.R. and Greenberg, J.F., Journal of Invertebrate Pathology, 1981, Volume 38, pp. 242-250. "Detection of Autographa californica and Heliothis zea Baculovirus Proteins by Enzyme-linked Immunosorbent Assay (ELISA)."

Vanessa J. DeVillez

Fields of Competence

Hydrogeologic analysis, including groundwater monitoring programs, aquifer testing, interpretation of analytical data, development and implementation of site investigations and sampling programs, site assessment, technical report preparation, and proposal development.

Experience Summary

Three years of varied hydrogeologic experience pertaining to hazardous waste, including the design and implementation of site investigations and assessments at NYS Superfund sites and remedial investigation/feasibility studies. Other work includes RCRA and ECRA compliance.

Education

B.S. Geology, Indiana University, 1982
Two years of graduate work in Geology, SUNY, Buffalo

Key Projects

- Assisted in a large-scale hydrogeologic investigation of a politically sensitive industrial site in Michigan, which included the implementation of a variety of well installation techniques, groundwater sampling methods, and sampling instruments.

- Conducted an ECRA investigation of a manufacturing plant site in New Jersey to determine the extent of potential contaminant migration from an underground tank source. The tasks performed included test borings and soil sampling, installation of and sampling of groundwater monitoring wells, and interpretation and evaluation of analytical data.

- Conducted information searches, site inspections, and wrote Phase I reports for several Superfund Sites in New York State.

- Performed a Geotechnical investigation at an inactive plant site in Pennsylvania owned by a major electronics corporation. This included site inspection, subsurface investigation, and soil sampling.

- Assisted in the development of a groundwater monitoring plan for a large hazardous waste landfill in Niagara Falls, New York owned by a major waste disposal corporation. This included subsurface investigations, statistical analysis of priority pollutant analytical data to determine background levels of groundwater contamination, and establishment of upgradient and downgradient groundwater monitoring points.

- Provided investigative and technical support to a major waste disposal corporation for a politically sensitive hazardous waste landfill in New York State.

- Performed various geotechnical investigations at a plant site in Oklahoma owned by a major electronics corporation. These included subsurface investigation, monitoring well installation, permeability testing, and determination of the extent of plume migration.

Professional Affiliations

National Water Well Association

APPENDIX K

TECHNICAL OPERATIONS PLAN AND SAFETY PLAN

TECHNICAL OPERATIONS PLAN
INSTALLATION RESTORATION PROGRAM
PHASE II (STAGE I) - CONFIRMATION/QUANTIFICATION
AIR FORCE PLANT 59
JOHNSON CITY, NEW YORK

Prepared by:

Fred C. Hart Associates, Inc.
530 Fifth Avenue
New York, New York 10036

Prepared for:

Department of the Air Force
Occupational and Environmental Health Laboratory
Brooks Air Force Base, Texas 78235

September 1986

(0078G-1)

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1.0 INTRODUCTION

As requested by the U.S. Air Force Occupational and Environmental Laboratory (OEHL), Fred C. Hart Associates has prepared the following Technical Operations Plan for Phase II confirmation work at the Air Force Plant 59 (AFP), in Johnson City, New York. The recommended work is based upon review of several documents; Phase I - Records Search (October 1984), and assorted data provided by the U.S. Air Force (USAF) and General Electric Company (GE) at the AFP, personnel and included data gathered at a site visit conducted on October 31, 1985. This specific approach was taken with the intent to fulfill the requirements of the USAF Phase II investigation philosophy.

1.1 Purpose of Study

The purpose of this study is to conduct a contaminant source investigation at the Air Force Plant 59 to determine: 1) the presence or absence of contamination within the specified areas of the field survey; 2) the potential for migration within the specified areas of the field survey; 3) the extent/magnitude of contamination of the AFP property; and 4) potential environmental consequences and health risks of migrating contaminants (if found) based on state and federal standards for these contaminants. HART will prepare a final report evaluating the results of the field investigation which will include all historic and current data collected by HART on the facility, an analysis of all data collected during the investigation and an identification of any contaminants which may have originated from property other than the AFP.

1.2 Site Description

The AFP is located in Broome County, New York, in the Village of Johnson City, about 3 miles west-northwest of the center of the City of Binghamton, and about 4 miles east of the center of the Village of Endicott. Other nearby towns (within 5 miles) include Maine, Chenango, Dickinson, Union, Binghamton, and Vestal. A location and vicinity map of AFP is shown in Figure 1, and a site map is shown in Figure 2.

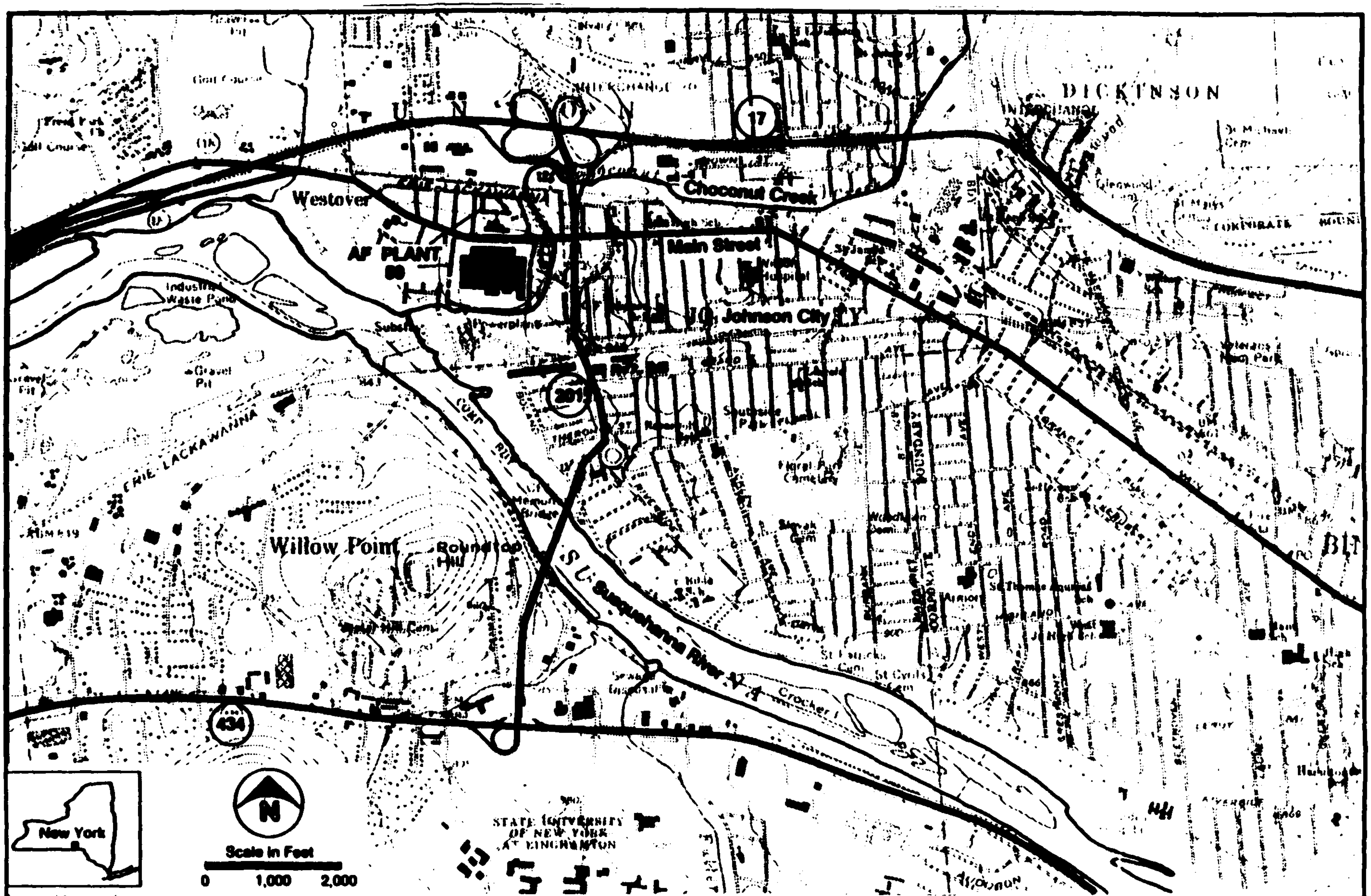
The total land area of AFP is 29.6 acres. The main entrance of AFP is at 600 Main Street (New York State Route 17C), which is the northern boundary of the installation. The AFP is located on a bend of Little Choconut Creek which runs just to the east and south of the installation. The confluence of Little Choconut Creek and the Susquehanna River is about 1,000 feet west of the southwest corner of the plant. A 0.6-acre parking lot which is part of AFP property, but not contiguous with the main plant-site, is located north of Main Street.

The AFP is an Air Force-owned electro-mechanical systems production facility operated under contract by the General Electric Company. Aircraft electronic equipment is manufactured for both military and commercial clients. Authority to use Government-owned facilities for non-government work is obtained on a continuing basis from the Defense Logistics Agency.

The mission of AFP is the manufacture and assembly of electronic and electro-mechanical equipment. General Electric Company is currently producing flight control systems, weapons control systems, laser systems, internal navigation and guidance systems, and aerospace ground support equipment.

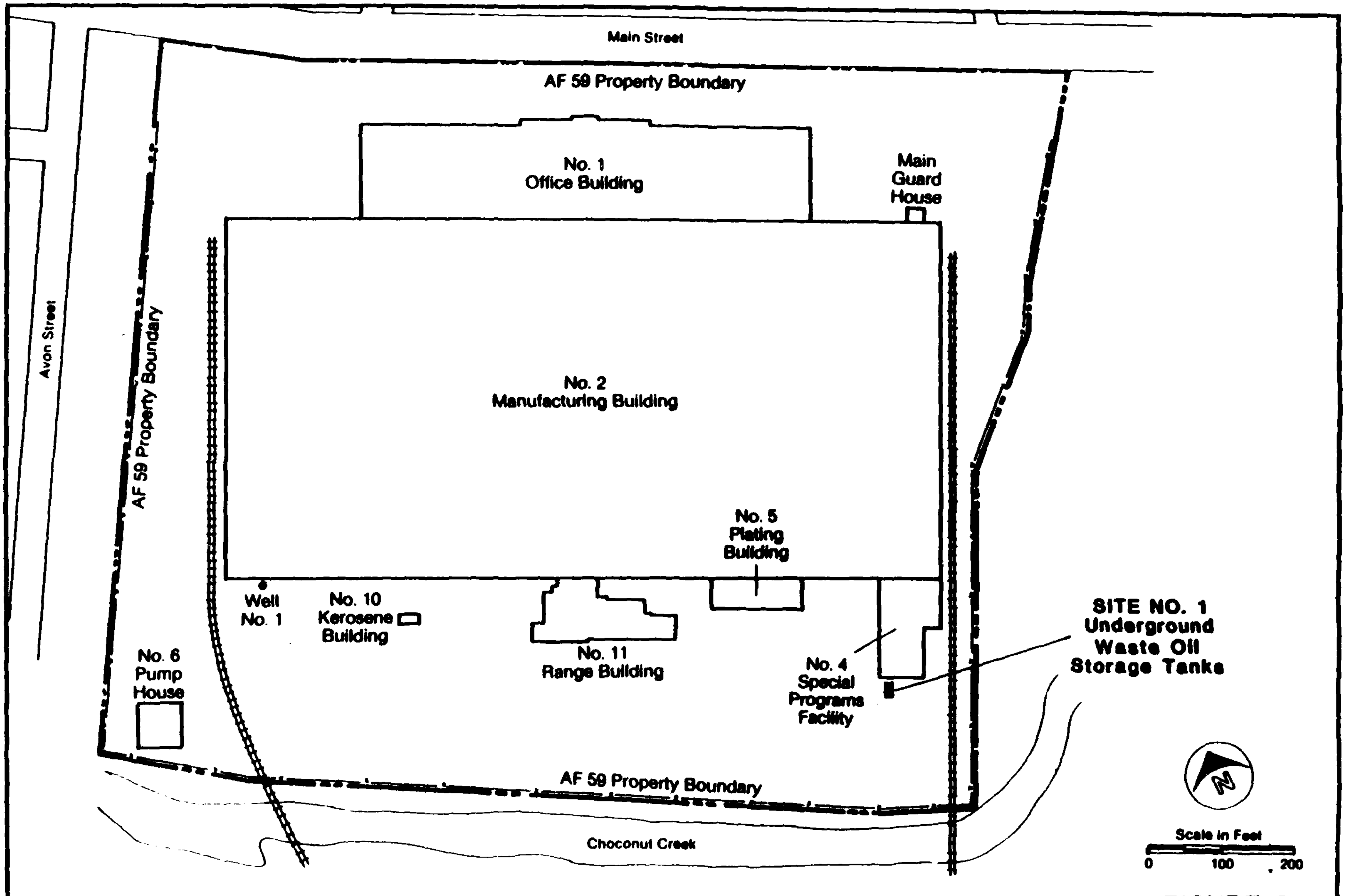
1.3 Site History

The AFP was designed and built by PLANCOR, the Defense Plant Corporation, a subsidiary of the Reconstruction Finance Corporation in 1942. The



From CH2M HILL, 1984

FIGURE 1
Location and Vicinity Map of Air Force Plant 59



From CH2M HILL, 1984

FIGURE 2

Site Map, Indicating Area of Potential Contamination

original building contained 621,500 square feet of floor space and has remained essentially unchanged.

The original contractor at the plant was Remington Rand, Incorporated. Remington Rand manufactured aluminum aircraft propellers for the Second World War effort from 1942 to 1945, and then closed. In April 1949, AFP was reopened as an aircraft controls manufacturing facility with General Electric Company as the sole contractor. The major manufacturing process at that time was parts machining for electro-mechanical control systems. Machine shop activity peaked in 1967 at the height of the Vietnam War effort.

Activity at the plant dropped off markedly in the 1970's. Parts machinery activities were further curtailed as a result of technological advances that have made control systems more strictly electrical in nature. Currently, 2,300 employees work at AFP on three shifts.

Several improvements have been made to the outdoor facilities at AFP over the years. In 1959, the gravel and dirt parking lots surrounding the manufacturing building were paved. New York State built an earthen containment dike along the banks of the Little Choconut Creek as part of a mid-1960s flood control project. A water supply well was drilled immediately south of the manufacturing building to reduce the plant's usage of municipal water in 1974. A water recharge well for non-contact cooling water was also drilled at this time but its use was quickly discontinued due to subsurface subsidence. General Electric Company discontinued its use of the railroad spur in the early 1950s, the spur was paved over, and the trestle over Little Choconut Creek was eventually removed in 1980.

General Electric Company currently manufactures flight control, laser systems, weapons control, internal navigation, and guidance systems at AFP. These systems are used in various military aircraft including the F-18, F-15, F-111, and B-1. In addition, a small amount of work is done for Boeing 757 and 767 commercial jets.

1.4 Hazardous Materials Handling

Industrial operations at AFP were performed by Remington Rand from 1942 to 1945, and by AFP from 1949 to the present. The plant was idle during the intervening 4 years. Remington Rand manufactured airplane propellers; AFP manufactures aerospace control and electrical systems. Manufacture of these aircraft-associated parts resulted in generation of varying quantities of the same waste products. Wastes generated are (a) waste oils, including cutting oils, lubricating oils, and coolants; (b) spent solvents, including degreasers; (c) spent process chemicals, including plating acids, caustics, chromium and cyanide solutions; and (d) paint residues. The total quantity of these wastes currently generated is about 50,000 gallons per year. Waste quantities are dependent on contractor workload and have varied over time.

In general, the standard procedures for past and present industrial waste disposal practices have been as follows: (1) concentrated plating baths have been neutralized in an above ground holding tank and removed by a contractor (1952 to present); (2) plating rinsewater was treated in a settling tank for metal precipitation prior to discharge to Outfall 001 (1952 to 1969); plating rinsewater was treated in a settling tank for chromium reduction and metal precipitation prior to discharge to Outfall 001 (1969 to July 1984); plating rinsewater is treated by an anion and cation exchange column and reused (July 1984 to present); (3) waste oils were primarily recovered, with some waste oils being discharged to an oil/water separator upstream of Outfall 002 (1942 to 1953); waste oils are discharged to two underground waste oil storage tanks and removed by a contractor (1953 to present); and (4) kerosene-based degreasing solvents were disposed of with the waste oils (1942 to 1969); spent solvents are drummed and removed by a contractor (1969 to present).

1.5 Potential Sources of Environmental Contamination

One main area of potential environmental contamination will be investigated in this study of the AFP. This is the Underground Waste Oil Storage Tanks area (Site No. 1) that has been used for the temporary

storage of waste oils since the two 1,000-gallon underground tanks were installed in 1953 (Figure 2). Waste oils including synthetic hydraulic oils, cutting oils, and coolants are collected from the various machining areas of the plant by a "Spencer Vac" system, which consists of a small mobile collection tank and vacuum system. Prior to 1969, some non-chlorinated kerosene-based degreasers were also placed in the storage tanks. Once collected, the waste oils are then pumped from the "Spencer Vacs" by an air pump located inside the main building to the two underground waste oils tanks located outside of Building No. 4. The waste oils are then temporarily stored for subsequent vacuum truck pickup and disposal by a private contractor.

The waste oil tanks are inspected daily to prevent overtopping of the tanks. However, waste oil spills have occurred during the contractor removal of the tank contents, which is conducted on a monthly basis. Interviewees reported that the spills were the result of the release of the residual volume of the vacuum truck suction hose. The area surrounding the tanks had been backfilled with gravel during their installation. The gravel area surrounding both tanks was heavily stained. In the past, the stained gravel had been removed and replaced with fresh gravel for aesthetic reasons.

1.5.1 Area 1. Area No. 1 has been identified as a potential threat due to the close proximity of wells and the fact that the population within 3 miles of the site is served by groundwater. The waste oils are identified are hazardous and persistent.

2.0 SITE INVESTIGATION SUMMARY

2.1 Introduction

The remedial investigation proposed by HART is designed to monitor the entire site of the AFP. The existing production well on site will be sampled as part of this investigation.

2.2 Task 2 Groundwater Supply Production Well

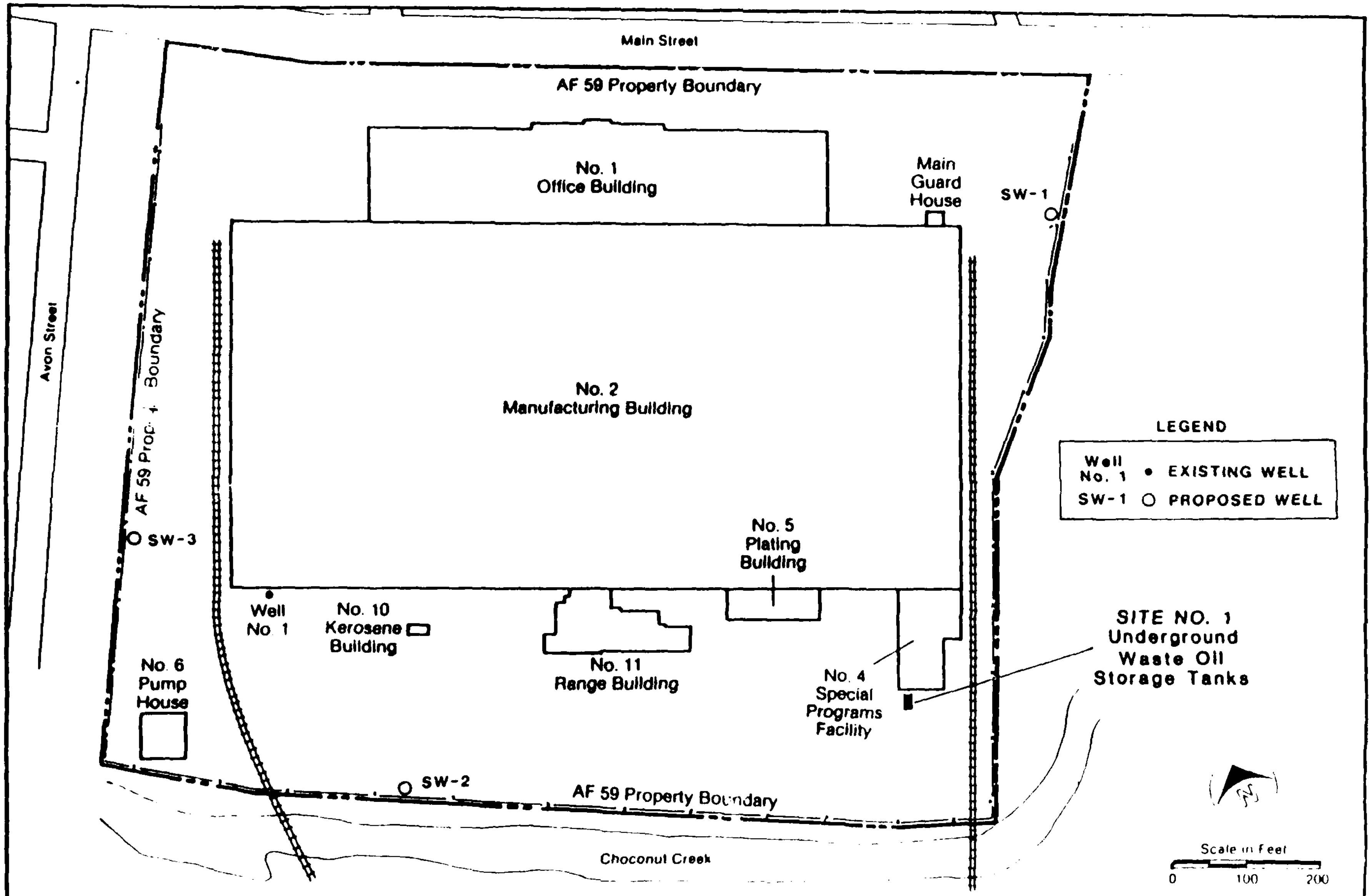
A groundwater production well at the AFP will be sampled, and the samples split with OEHL according to the Technical Operations Plans. The well will be tested in the field for specific conductance, temperature and pH. The laboratory analyses include Halogenated Volatile Organics, Aromatic Volative Organics, RCRA Metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag), Cyanide, and Petroleum Hydrocarbon.

2.3 Task 3 Groundwater Monitoring Well Installation

Three shallow boreholes (35 feet) SW-1, SW-2, SW-3, will be drilled around the Area 1 (two downgradient, one upgradient) and be completed as groundwater monitoring wells with a split spoon sampler (Figure 3). Wells will be constructed of 2 inch Schedule 40 PVC flush joint casing with machine slotted 10 slot (.01 inch) screen that are 10 feet in length (Figure 4).

Each well will receive a filter pack, bentonite seal, have the annular space grouted to the surface, and a protective casing with locking cap will be installed. Each sample that is described will be screened with an Organic Vapor Analyzer (OVA) to determine the presence and degree of hydrocarbon contamination. Wells will be installed through a 6 inch O.D. hollow stem auger. The augers will be cleaned with a steam cleaner between each borehole.

The boreholes sampled every 5 feet in the unsaturated zone and be continuously sampled in the aquifer.



From CH2M HILL, 1984

FIGURE 3

Location of Groundwater Monitoring Wells

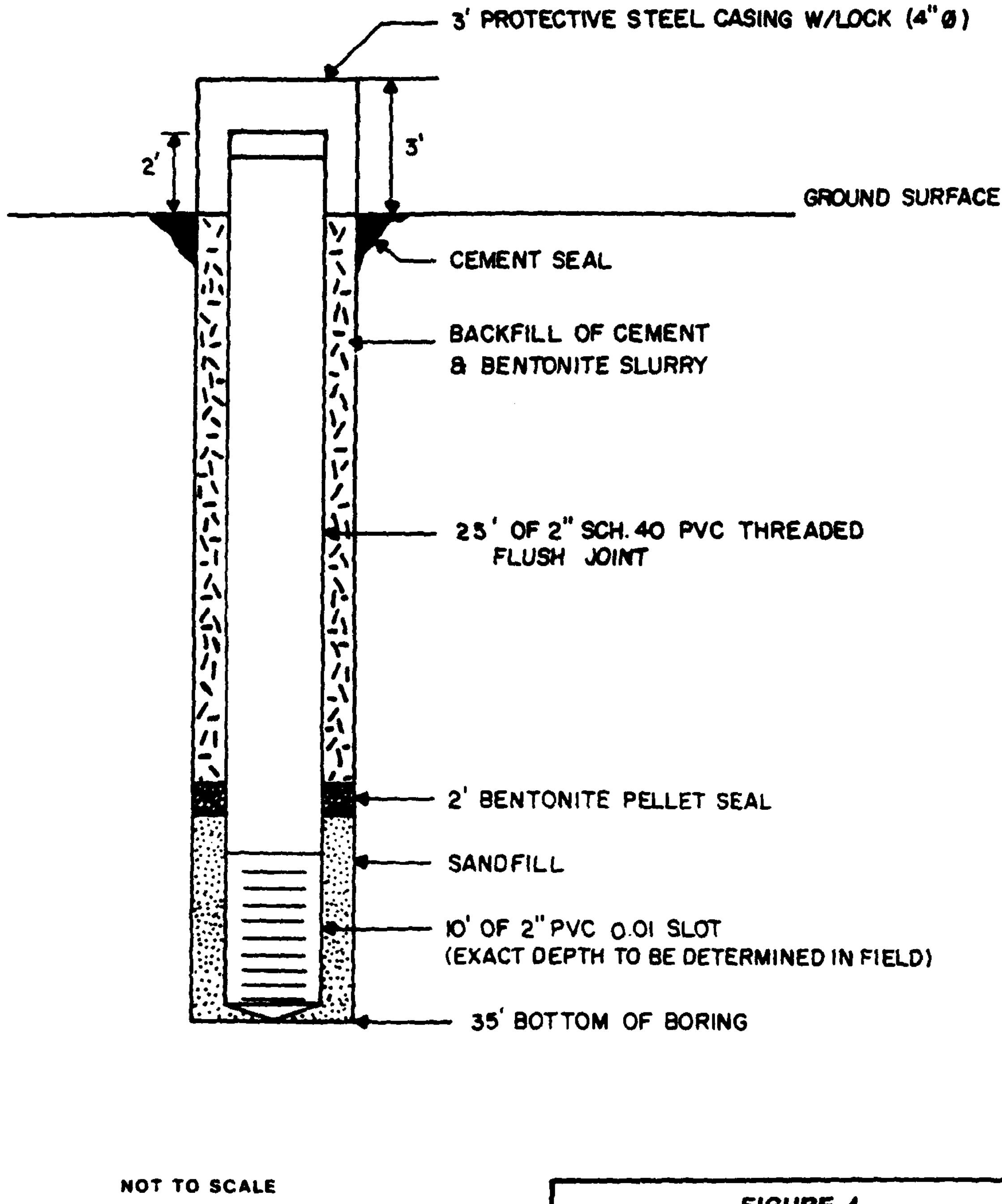


FIGURE 4

GENERALIZED WELL CONSTRUCTION DIAGRAM

FRED C. HART ASSOCIATES, INC.

Geochemical analysis will be performed on six soil samples, two from each borehole. One sample will be taken from the soil-water interface and another from the most contaminated portion of the borehole. The laboratory analyses will be performed for Halogenated Volatile Organics, Aromatic Volatile Organics, Cyanide and Petroleum Hydrocarbons. RCRA metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag). A duplicate sample will be analyzed for the same parameters.

Geotechnical analyses will be performed on soil samples to determine permeability and grain size distribution. Six shelby tube samples, two from each well, will be taken in the saturated zone and the underlying clay for falling head permeability testing. The sample depth will be chosen in the field. Additionally, two soil samples from each of the three shallow wells will be analyzed for grain size distribution (sieve and hydrometer analysis). If possible, one sample from each borehole will be unsaturated and the other saturated.

The soil from the boreholes will be drained in DOT approved 55 gallon drums and left in a temporary staging area along with the development water (if presence of contamination is found) until analysis is complete. If the drums prove to be non-hazardous they will be left at the AFP. If they are classified as hazardous waste, then HART will supervise their removal to an approved disposal site.

2.4 Task 4 Groundwater Sampling Program

A total of 4 wells will be sampled (Figure 3). This includes the 3 wells installed for this study and the existing production well. Prior to sampling, all wells will be properly flushed to provide representative samples. Bailers will be decontaminated between wells. Samples will be placed in properly prepared bottles, and placed in a cooler at 4°C. Coolers will be sealed and shipped overnight to Princeton Testing Laboratories. Samples will be split and a set of samples will be sent to OEHL in Texas. Proper chain-of-custody procedures will be followed which are described in Section 14.0.

The wells will be tested in the field for specific conductance, temperative and pH. The laboratory analyses include Halogenated Volatile Organics, Aromatic Voltile Organics, RCRA metals (As, Ba, Cd, Cr, Pb, Mg, Se, Ag), Cyanide and Petroleum Hydrocarbons. One duplicate sample will also be taken and analyzed for the same parameters.

QA/QC procedures for Princeton Testing Laboratories and detection limits for the various testing parameters are found in Section 7.7.

Wells will be sampled all at once rather than individually because it is more convenient to perform one round of sampling, than sample individual wells as they are completed. Also, samples cannot be stored for any length of time, requiring samples to be shipped within a few days of their collection.

2.5 Task 5 - Surveying of Wells

A professional surveyor will survey the horizontal and vertical locations of the wells.

2.6 Task 6 - Water Level Measurements

Measurements will be made of all the water levels in all groundwater monitoring wells at the AFP. This will be completed in one day.

2.7 Task 7 - Training of USAF Personnel to Perform Certain On-Going Portions of the Work

Hart Associates will train USAF personnel to take groundwater levels and samples in the monitor wells, and prepare monthly reports.

3.0 FIELD SET-UP

3.1 Detailed Work Plan

Prior to undertaking sampling or drilling operations, HART will prepare for an effective and safe field investigation at the AFP. This will include establishing a command office and materials storage area. Portable decontamination equipment necessary to perform operations will be provided as described in Section 11.0, Decontamination Procedures. HART and its subcontractors will also have sufficient safety equipment of adequate quality and level to equip the number of personnel necessary to perform the sampling described in this plan, according to the Site Safety Plan prepared for this investigation (Appendix A).

HART is responsible for having in the field the subcontracted drilling, sampling and well testing equipment necessary to perform the required work. This will include providing drums and other facilities necessary for temporary field storage of potentially contaminated soil, and disposable equipment. In particular, drilling cuttings will be placed in drums during the drilling operations. This material will be tested for hazardousness (EP Toxicity and Ignitability tests) and if found hazardous, AFP will arrange for disposal of the material in a secured landfill.

This Technical Operations Plan contains the details of the work planned at the AFP and will be available to on-site personnel.

3.2 Health and Safety Plan

To protect the health and safety of field personnel a Health and Safety Plan identifying the expected hazardous material and levels of safety is found in Appendix A.

3.3 Subcontractors

Several subcontractors have been identified to perform work on this site and are listed below:

- Laboratory Analysis

  Princeton Testing Laboratories
  Princeton, New Jersey

- Surveyor

  Hawk Engineering
  Binghamton, New York

- Geotechnical Testing

  J & L Testing Laboratory
  Pittsburgh, Pennsylvania

- Borehole Drilling & Monitoring Well Installation

  Empire Soil Investigations Inc.
  Groton, New York

4.0 CALIBRATION OF FIELD EQUIPMENT

The following measuring equipment will be necessary to use for the on-site remedial investigation.

OVA. For in-field analysis of soil-gas during drilling, screening of soil samples taken during drilling and sediment samples. Calibration required: The OVA will be calibrated so that the relative response of the instrument will be 100% for tetrachloroethylene or methane.

pH Meter. For in field analysis of water samples. Calibration required: Factory or laboratory buffer and litmus paper will be used.

Electrical Conductivity Meter. For measurement during well sampling. Calibration: Factory calibrated annually.

Mercury Thermometers. For measurement of water temperatures during sampling. Calibration: Factory calibrated once.

M-Scope. For measurement of water level in well. Calibration: Periodically measured against surveyor's tape.

Other equipment that might become necessary during the field investigation will be calibrated according to the manufacturers' recommendations and/or generally accepted practice. Calibration procedures will be documented for the project file.

5.0 PREVENTIVE MAINTENANCE OF FIELD EQUIPMENT

All equipment used by HART and it subcontractors for work for the off-site remedial investigation will be required to be maintained under a preventive maintenance program. HART uses a program of preventive maintenance for the following equipment expected to be used.

- OVA
- pH Meter
- Electrical Conductivity Meter
- Mercury Thermometers
- M-scope

HART will subcontract the following activities during the study.

- Drilling and installation of monitoring wells
- Surveying of measuring points for wells

HART has specified or will specify to subcontractor firms providing these services that any and all equipment used at the AFP be maintained in a proper and safe working order. Any equipment or device determined to not be in such order by HART field personnel will be replaced, repaired, or corrected.

6.0 FIELD ANALYTICAL PROCEDURES AND DATA REPORTING

6.1 Chemical Data

- Procedures for Field Measurement of pH. Readings will be taken periodically in buffer solutions of the appropriate range at the same temperature during repeated sampling events. The users manual for the pH meter will be available to field personnel.

- Procedures for Field Measurement of Electrical Conductivity. When rapid sample changes are not occurring or expected, replicate measurements will be made. A standard solution of known conductivity may be made available for checking precision. Several readings are taken and the arithmetic mean used as the reported value. The users manual for the electrical conductivity meter will be available to field personnel.

- Procedures for Field Measurement of Volatile Organics. Approximately 20 ml of soil will be placed in VOA vials. The vials will be placed in a 50°C hot water bath for 10 minutes. An aliquot of air from the head space within the vial will then be withdrawn by syringe for direct injection into the OVA. Air monitoring during drilling will be performed utilizing the OVA in the survey mode.

6.2 Hydraulic Data

- Procedures for Measurements. An M-scope will be used to measure to 0.01 foot the water level under static (non-pumping/static) conditions.

6.3 Soil Boring Data

- Soil Sampling. Continuous split spoon samples and Shelby tubes will be collected at each test boring site. Sample depth will be monitored by the subcontractor (driller) under the supervision of the on-site geologist.

- Blow Counts. Soil density shall be determined by recording the number of blows necessary for the split spoon to penetrate six inches of soil.

6.4 Surveying Data

- Horizontal Location. All sampling sites and monitoring wells will be located on aerial photographs or other map by reference to known features. Location accuracy will be one foot in general.

- Vertical Location. The elevation of all new monitoring wells and existing wells will be surveyed by a subcontracted licensed surveyor to the nearest 0.05 foot.

7.0 SAMPLE NUMBERING SYSTEM

A sample numbering system will be used to identify each sample taken during the on-site remedial investigation. The numbering system will provide a tracking procedure to allow retrieval of information about a particular site and assure that each sample is uniquely numbered. A listing of sample numbers will be maintained by the HART field team leader. Each sample number will consist of five parts as described below.

7.1 Project Identification

The designation AFP 59 will be used to identify the Air Force Plant 59.

7.2 Site Identification

Each sampling site will be identified by a three to four letter identifier code, with the following prefix:

DW Deep Production well
SW Shallow monitoring well

A numerical suffix unique to each prefix will follow. A map and surveyors data will be used to locate each sampling site.

7.3 Sequence Number

A two letter code will be used to identify the type of sample collected, such as:

SS soil sample collected during drilling
SD sediment sample
GW groundwater sample
WS Surface water sample

7.4 Sample Depth

The depth or depth interval at which the sample is collected will be noted on the label.

7.5 Investigation Sequence Sample Number

In addition to the numbers and symbols used to identify the location, type and depth of a sample, a numbering system will be used to indicate the the order in which samples are sent to the various laboratories. This system will begin with the first chemical sample selected and end with the last. It will consist of a three digit number and will sequentially record the the chemical samples selected during the investigation. The purpose is to track the chemical samples in order to identify any gaps. A duplicate system will be maintained for the split samples.

7.6 Split Sampling

Two sets of samples will be collected for the groundwater samples. The labels HART, for Fred C. Hart Associates, and USAF OEHL to indicate the sample that will be sent to the USAF OEHL laboratory, will be used to differentiate the analyzer of each set.

7.7 Examples

Examples of sample numbers are:

- AFP 59, SW-1, SS-3, 4'-6', HART 005. Air Force Plant 59; 35 foot deep Monitoring Well #1; third soil sample collected between a depth of four and six feet below the surface; retained by HART. Fifth chemical sample selected for analysis.

- AFP 59, SW-1, SS-3, 4'-6', EPA 005. Same as previous sample, except it is retained for analysis by EPA-designated laboratory. Also identified as fifth chemical sample split and sent to OEHL. EPA.

7.8 Blanks, Knowns, Spikes, Splits and Duplicates

QA/QC blank and duplicate samples, to be sent to the USAF OEHL laboratory and the HART subcontractor, Princeton Testing Laboratories at Princeton, NJ, will be given sample numbers similar to those for collected samples except that the sequence number will be unique. The identity of QA/QC samples will be recorded in field log books, but will not be marked in any way on the sample containers. Ten percent of all soil samples and ten percent of all water samples will be duplicates and there will be one trip blank for every shipment of VOAs of groundwater. Five percent of each sample type will be trip blanks.

7.9 USAF OEHL Samples

Samples sent to the USAF OEHL laboratory will be accompanied by the following information:

1. Purpose of sample (analyte).
2. Installation name (base).
3. Sample number (on container).
4. Source/location of sample.
5. Contract task number and title of project.
6. Method of collection (bailer, suction pump, air-lift pump, etc.).
7. Volumes removed before sample taken.
8. Special conditions (use of surrogates, filtering, etc.).
9. Preservatives used, especially nonstandard types.

8.0 DRILLING AND INSTALLATION OF GROUNDWATER MONITORING WELL

Three new monitoring wells are planned for installation. The proposed locations are shown in Figure 2. Each well site and maximum depth of drilling and casing are described below:

- SW-1, SW-2, SW-3 - Depth = 35 feet; screened interval = 25 to 35 feet., 2-inch diameter casing in 6-inch diameter hole.

Subcontractor specifications for drilling and installing the groundwater monitoring well have been prepared by HART and will be used for the project.

8.1 Drilling

The boreholes will be drilled using 6-inch O.D. hollow stem auger. Prior to drilling the wells, each site will be staked and underground utilities will be checked by AFP personnel.

All drilling equipment and materials will be decontaminated prior to and after use according to procedures found in Section 11, Decontamination Procedures. Hollow auger drilling will be performed with hollow-stem augers having an internal diameter large enough to accommodate a 2-inch diameter sampler. The lead flight of augers will be equipped with an appropriate cutting bit to allow penetration of a wide range of materials varying from clay and silt to sand and gravel.

Solid waste from the drilling will be analyzed as they are generated with the OVA. Drill cuttings will be drummed as they are generated. If hazardous chemicals of concern are not detected, the materials will be disposed of on-site. If drill materials are determined to be hazardous, they will be drummed for later disposal by AFP. Drummed materials will be tested for EP Toxicity and Ignitibility as well as Priority Pollutants.

Proper disposal of the material will depend on test results.

8.2 Soil Sampling

Soil samples will be collected during drilling with split-spoon drive samplers of two-inch outside diameter. Decontamination procedures for sampling equipment are described in Section 11.0. Samples will be taken every five feet in the unsaturated zone and in the aquifer continuously (i.e., from two foot intervals the length of the boring) using a two foot long split spoon sampler. All soil samples will be logged in general accordance with "Description of Soils (Visual Manual Procedure)", ASTM D2488-69, which is based on the Unified Soil Classification System.

A portion of the soil sample from the least disturbed center of the split spoon will be placed in a VOA vial for on-site OVA analysis. The remaining portion of the soil sample will be placed in a properly labeled glass jar. The VOA vials will be analyzed in the field for the presence of volatile organic compounds and the results recorded. Based on the results, soil samples will be selected for submittal to the laboratories for further analysis.

Undisturbed samples for triaxial permeability tests using a Shelby tube sampler will be taken if a confining layer is encountered during drilling. Both ends of the retrieved shelby tube shall be sealed with wax and no other form of sampling will be attempted from the tube to insure the integrity of the undisturbed sample. Also, two samples per borehole will be obtained for grain size analysis.

Unless otherwise indicated by the OVA screening tests, it is anticipated that all soil samples will contain only low or medium concentrations of organics and low concentrations of inorganics.

8.3 Monitoring Well Construction and Completion

A maximum depth for each well has been established in the Scope of Work. The well screen will be installed at a depth to capture any floating contaminants. A generalized well construction diagram is shown in Figure 4.

The open borehole below the interval to be screened will be backfilled with appropriate material such as clean sand, or gravel pack.

All wells will be 2-inch diameter PVC flush joint riser and have 10 foot length screens. All screens will have a slot (aperture) size of 0.010 inch. Riser pipe will be the same diameter as the screen and connected only by threaded type joints.

The gravel pack will consist of acid-resistant, washed and graded silica sand. The sand will be furnished in sacks and will be clean and free from oil, acid, organic matter or other deleterious substances.

The gravel pack material will continue to be added to the annulus until the entire screen is surrounded and the gravel has extended about 3 feet above the top of the screen. A 5 foot thick bentonite pellet layer will then be placed in the annulus through the augers and set directly on the gravel pack. The bentonite pellet seal will assure that no grout materials will percolate through the gravel pack and enter the well.

All but the top 2 feet of remaining annulus will then be tremmie grouted with a granular bentonite/cement slurry mixture. A 5 foot long steel casing will be set into this cement. If possible, this outer steel casing will extend about 3 feet above ground surface. The outer protective steel casing will come to rest within several inches of the top of the riser pipe, and will have a locking cap.

Following the completion of each monitor well, HART field personnel will construct a detailed well-completion sketch. This well summary will also detail the composition and amount of the materials used during well construction.

8.4 Well Development

All groundwater monitoring wells will be developed as part of the well installation process. Development will be done to create a good hydraulic connection between the well and the aquifer in which it is screened. This is important for obtaining reliable groundwater data and representative groundwater samples. Well development is achieved by removing fine grained geologic materials away from the well screen. Each well will be developed as soon as practical after completion by jetting. If possible, well development will continue until discharge water is clear and free of sediments.

9.0 GROUNDWATER MONITORING AND SAMPLING

A total of 4 wells will be sampled. This includes the 3 wells (SW-1, SW-2, SW-3) installed for this study and the one existing production well (DW-1). All measuring, purging and sampling equipment will be decontaminated as described in Section 12.0 prior to data collection.

9.1 Groundwater Level Measurements

After all well installation is completed, the groundwater level of all the wells will be measured within a 24-hour period. The instrument (M-scope: Slope Indicator Co., Model 51453) or similar instrument will be lowered down the well and measured from the top of the PVC casing. When the electrode of the M-scope comes into contact with water, an audio signal will be emitted. The instrument will also be used to sound the bottom of the well. HART will train AFP personnel to take additional groundwater levels in the monitor wells that will be installed during this investigation. Groundwater levels must be periodically monitored in order to determine groundwater flow directions over time. It is not cost-effective for HART personnel to travel to the site for the limited time period required to take these measurements. AFP personnel will be trained to provide monthly groundwater level measurements in the wells.

9.2 Surveying of Wells

A professional surveyor will survey the horizontal and vertical locations of the wells. Survey elevations of all newly installed monitor wells will be done with respect to a U.S.G.S. Bench Mark and will be measured to an accuracy of 0.01 feet. Horizontal locations will be done to an accuracy of 1 foot and recorded on site maps. It is necessary to establish the elevation of well casings for calculation of groundwater elevations.

9.3 On-Site Analysis

Monitor Well Sampling. In order for valid representative groundwater samples to be collected from the monitor wells, it is very important to

properly prepare the well prior to sample collection. This preparation entails removing all the water which is standing in the casing and grabbing the sample from water which has recently been recharged from the aquifer.

To accomplish this, the depth to water from the top of the well casing is measured. This value will be used in conjunction with the total casing length to determine the height of the water column. The volume of water standing in the well will then be calculated. Three times this volume will be removed by pumping or bailing before the sample is collected. In cases where a well is emptied until dry and is very slow to recover, the volume required for evacuation may be reduced to two or three standing water volumes.

Once the well is adequately evacuated, sample collection will be accomplished by lowering a stainless steel, bottom loading bailer with a teflon check valve into the well. Each bailer will be fitted with a stainless steel wire leader and a new piece of nylon cord. A different pre-cleaned bailer will be devoted to each well. If the bailer has not been used for well evacuation, the first 3 bails of water will be wasted to rinse any cleaning agents which might still be present on the bailer. The samples will be poured directly from the bailers to sample jars for temperature, pH, and specific conductance.

Temperature. Measurements of the sample temperature will be taken using a decontaminated mercury thermometer. The field measurement represents the temperature of the aquifer unit at a particular location and time. Variations in sample temperature may enable interpretation of a temperature gradient which reflects aquifer hydraulics. This measurement will also be used to calvibrate the pH and conductivity meters in the field.

pH. The pH of each sample will be measured with a Corning Model 3 pH Meter or similar instrument. Field measurements of sample pH will be used as a relative check of the lab measurements. The pH of a sample tends to change upon contact with air, and stabilizes once the sample becomes fully

aerated. Therefore, the pH measurements of aerated samples will be used as a relative indicator of groundwater contamination.

Specific Conductivity. The specific conductivity of each sample will be measured with a Hach Model 17250 Conductivity Meter or similar instrument. Elevated specific conductivities indicate the presence of conductive ions such as chlorides and sulfides in the groundwater. High concentrations of these ions indicate contamination.

9.4 Sampling for Off-Site Analysis

Prior to sampling for lab analysis, all wells will be properly flushed as described above in Section 9.3. Bailers will be used to obtain groundwater samples. Bailers will be decontaminated between wells. Samples will be placed in properly prepared bottles, and placed in a cooler at 4°C. Coolers will be sealed and shipped overnight to the designated laboratory. Samples will be split and one sample will be shipped to Princeton Testing Labs. Proper chain-of-custody procedures will be followed when transferring the samples from the field to the laboratory. In addition, accurate records will be kept of all sampling activity, and will include the following information: Date, time, location, sample number, depth to water measurement, method and volume of water evacuation and sampling techniques. Analytical parameters can be found in Section 2.0.

10.0 DECONTAMINATION PROCEDURES

All equipment which comes in contact with potentially contaminated soil or water, including OVA, drilling, soil and water sampling, water-level measuring and sample preparation equipment, will be cleaned prior to and after each use on this project. Decontamination will consist of combinations of steam cleaning and/or detergent (trisodium phosphate) wash, water rinse, methanol rinse and distilled water rinse.

10.1 Drilling, Soil Sampling and Monitoring Well Installation

All drilling equipment will be decontaminated by steam-cleaning between locations, to prevent the chance of cross contamination from one location to another. All tools used for soil sampling and packaging, including split barrel samplers, sample-cutting knives, etc., will be decontaminated prior to the collection of each sample. Decontamination of these tools will include a wash in distilled water, a solvent rinse, and a second rinse with distilled water. Monitoring well casing, screens and fittings are to be delivered to the site in a clean condition.

During the field sampling program, the OVA will be checked periodically for contamination by running an analysis of a known compound of air. When necessary, the equipment will be decontaminated prior to continuing work, but not less frequently than once per day. OVA equipment to be decontaminated as necessary will include syringes, injection ports, columns and detectors.

10.2 Well Development

All equipment used for well development will be decontaminated prior to and after use at each well. This will include decontamination of downhole piping. The decontamination procedures will be similar to those described for drilling equipment in Section 10.1.

10.3 Water Level Measurement

The electrical sounding (M-Scope) tape used to measure water levels will be cleaned with a disposable soap-impregnated cloth and wiped with methanol upon removal from each well to avoid chemical cross-contamination between wells.

10.4 Water Sampling

Stainless steel bailers will be decontaminated before and after each use by detergent wash, clean water rinse, methanol rinse and distilled water rinse. No bailer shall be used at more than a single well after and prior to decontamination. A new piece of nylon rope will be used as the hoisting line and disposed of when sampling is completed at each well.

Submersible pump, piping and fittings will be decontaminated prior to and after use at each well. The equipment will be decontaminated by either steam-cleaning or hot water and detergent wash rinse followed by a methanol rinse, and rinsed with distilled water.

10.5 Personnel Decontamination

The personnel decontamination procedures to be used at AFP will be performed at each drilling location or other sampling sites prior to entering vehicles or leaving the study area. HART and each subcontractor will provide all protective clnothing for its own personnel and the equipment necessary to comply with decontamination procedures specified in the Site Safety Plan (Appendix A).

In the interest of expediency and efficiency, the following personnel decontamination procedures will be followed, if necessary. However, it is anticipated that field investigation activities will be conducted at level D.

1. Remove disposable booties (if used) and place into plastic bag for disposal.

2. Wash outer gloves in detergent solution and rinse in clean water. Remove outer gloves and place into plastic bag for disposal or retain for subsequent reuse.

3. Wash neoprene boots with detergent solution and rinse with clean water. Remove boots and retain for subsequent reuse.

4. Remove the tyvek coveralls. Take care to prevent the release and dispersion of dusts which may have accumulated on the coveralls during on-site operations and place overalls into the disposable plastic bag.

5. Place all independent disposable bags into one larger bag. Seal this bag and dispose of as garbage unless OVA probe of samples indicates contact with high concentrations of hazardous materials. If high concentrations are indicated, disposables will be placed in a 55-gallon drum with other solid wastes for eventual disposal by AFP.

6. Thoroughly wash hands and face.

11.0 SAMPLE HANDLING AND PACKING

11.1 Split Sample Procedures

All water, sediment and soil samples shall be split along the guidelines of Quality Assurance/Quality Control (QA/QC) protocols and procedures established by HART. One set of samples will be forwarded for analysis through overnight delivery to Princeton Testing Laboratories, Princeton, New Jersey. The other set of samples will be forwarded for analysis through overnight delivery to OEHL.

The following procedures will be used for splitting soil and groundwater samples.

Soil. Only fairly homogenous samples will be chosen providing a minimum of pebble-sized particles. Initially, the sample will be placed in a stainless steel bowl. Prior to placing the sample in the bowl, the bowl would have been washed with a detergent, rinsed with distilled water and washed again with a solvent (methanol). The sample will be mixed with a stainless steel trowel (prepared in a manner similar to the bowl) until the sample is well combined. Then a sample will be split into halves and a portion of each half placed into a sample container. The sample then will be remixed, split again, and portions placed into the containers. This procedure will be followed until the sample containers are filled.

Groundwater. A properly prepared bailer will be used to obtain a sample. If the sample is to be tested for volatile organic compounds (VOA), the VOA vials will be placed into a properly cleaned beaker whose depth is greater than the height of the vials. Water from the bailer will be care fully poured into the beaker so that the level rises above the height of the opening on the VOA vials. Once the VOA vials are filled, they will be closed by stainless steel tongs and lifted from the beaker. For other parameters, one-half of the water in the bailer will be poured into one container and the other half into the other container. Additional bails will be obtained and split in a similar manner until a sufficient volume of sample is obtained.

11.2 Sample Containers

Glass jars for soil samples in borings will be provided by HART. HART will also supply VOA vials for on site OVA analysis. Water and soil samples for chemical analyses will be placed in glass jars or plastic containers supplied by the laboratory subcontracted by HART.

11.3 Sample Handling and Decontamination

The collected sample and its container represent on of the major avenues of personnel and environmental exposure. Precautions will be taken to ensure that all the samples removed from the site are within the sample container and that no residue remains on the outside of the container.

The procedure for collecting soil and sediment samples will be as follows:

- Identify and document sample collection point or points, depth increment of samples collected, and sampling devices used (See Section 14.0, sample Custody and Documentation).

- Complete log book entries, sample tags, field record sheets with sample identification point, date, time and names or initials of all persons handling the sample in the field.

- Clean the outer surface of glass jars containing soil samples with paper towers and clean water.

- Place Sample Tags on sample containers.

- When filling jars, place small plastic bag around outside of sample container and hold in place with rubber band so that sample spilled outside of container will not contact jar.

- Sealed sample containers will be carried by the sampling team member to the packaging area. The outer plastic bag and rubber band should be removed by the sampler without touching the external surface of the jar any more than necessary. The volume level should then be placed by the sampler on a clean surface to be packaged for shipment.

- The contaminated plastic bags, rubber bands, and residual soil from the mixing pan will be bulked in large plastic bags for disposal as garbage.

The procedures for collecting water samples are generally the same as for soil and sediment, except that the water is discharged directly from the bailer to the sample container(s), following filtration if necessary, and appropriate preservatives are added to the containers prior to capping.

11.4 Procedures for Packing Samples

Most samples collected during this investigation are expected to contain low concentrations (less than 10 ppm) of organic and inorganic chemical compounds and will, therefore, be considered environmental samples. Procedures for packing low-concentration soil and water samples for shipment will be as follows:

- Determine maximum weight allowed per package from your shipper (140 pounds for Federal Express shipment).

- Secure sample bottle lids or plastic caps on brass tubes with stripping tape or evidence tape.

- Mark volume level on bottles with grease pencil.

- Place about three inches of inert cushioning material, such as vermiculite or zonolite in bottom of cooler.

- Labels/Sample Tags. Numbered sample tags should be used on all samples. Cover the labels with clear plastic tape.

- Place containers in cooler in such a way that they do not touch.

- Put VOA vials in Ziploc plastic bags and place them in the center of the cooler.

- Pack bottles, especially VOA vials, in inert cushioning material.

- Fill cooler with inert cushioning material and blue ice if sample refrigeration is required.

- Put paperwork, chain-of-custody and Form 2752 (for OEHL), in plastic bags and tape with masking tape to inside lid of cooler.

- Tape cooler drain shut.

- After acceptance by Federal Express or shipper, wrap cooler completely with strapping tape at two locations. Secure lid by taping. Do not cover any labels.

- Place lab address on top of cooler.

- Put "THIS SIDE UP" labels on all four sides and "FRAGILE" labels on at least two sides.

- Affix numbered custody seals on front right and back left of cooler. Cover seals with wide, clear tape.

12.0 SAMPLE CUSTODY AND DOCUMENTATION

Sample custody and documentation procedures described in this section will be followed throughout all sample collection at AFP. See Section 7.0 for the Sample Numbering System to be used by HART.

12.1 Sample Identification Documents

All samples will be labeled for identification by the Sample Numbering System described in Section 7.0.

Sample Tags. Samples will be removed from the sample location and transferred to Princeton Testing Laboratory. Split samples will be sent to the OEHL. Before removal, however, samples will be separated as necessary into fractions depending on the analysis to be performed. Each portion will be preserved in accordance with prescribed procedures. Each portion will be identified with separate identification tag. Each tag should indicate in the "Remarks" section that it is a split sample. The information recorded on the tag will include:

- Purpose of the sample (analyte)
- Installation name (location)
- Sample number
- Source/location of sample
- Contract Task Number and Title of Project
- Method of collection (split spoon, bailer, etc.)
- Volumes removed before sample taken
- Preservatives used, especially any non-standard types
- Project code (an HART project number)
- Date
- Time (a four-digit number indicating the 24-hour clock time of collection; for example: 1430 for 2:30 pm)

- Type of sample (grab or composite)
- Sampler's name
- Special conditions/remarks (for example, use of filtering)

Custody Seals. When samples are shipped to a laboratory or returned to a HART office, they must be placed in padlocked containers or containers sealed with custody seals. Two seals must be placed on each shipped container (cooler), one at the front and one at the back. Clear tape should be placed over the seals to ensure that seals are not accidentally broken during shipment.

12.2 Chain-of-Custody Records

All samples will be accompanied by a Chain-of-Custody Record, examples of which are shown on Figure 5. When transferring samples, the individuals relinquishing and receiving should sign, date and note the time on the record. This record will be used to document sample custody transfer from the sampler, to another HART team member, to a shipper, to a laboratory or to a HART office. Sample splits made for CEHL will be transferred with Chain-of-Custody Record and Environmental Sampling Data Form 2752 (Figure 6).

Samples will be packaged properly for shipment and dispatched to the appropriate laboratory for analysis, with a separate Chain-of-Custody Record accompanying each shipment. The method of shipment, courier name(s), and other pertinent information should be entered in the "Remarks" section of the Chain-of-Custody Record.

All shipments will be accompanied by the Chain-of-Custody Record identifying its contents. The original record accompanies the shipment, and the yellow copy should be given to the HART field team leader.

Shipments will be sent by common carrier and a bill of lading will be used. Air freight shipments will be sent collect. Bills of lading will be retained as part of the permanent documentation.

RED C. HART ASSOCIATES, INC.
630 FIFTH AVENUE
NEW YORK, N.Y. 10036

CHAIN OF CUSTODY
Abbreviated Form

FORM : ML 10/12

Date Rec'd: ______

Client Name: ______ Client No: ______

Sampled by: ______ Sample Group ID or site name: ______ ID or Permit No.: ______

Sample Name or Outfall No.	Date Sampled	Field pH	Field Cond.	Temp.	Flow (gpm)	Notes	ML No.

Analysis Requested:

___ pH, Alkalinity, Conductivity	___ Sus. Solids	___ Oil & Grease	___ Iron (Fe)
___ Acidity (Mineral or Total)	___ Dis. Solids	___ Dis. O_2	___ Manganese (Mn)
___ NH_3, NO_3, NO_2, TKN, Org. N	___ Total Solids	___ Coli - Fecal	___
___ CN, CN-free, F	___ Turbidity	___ Coli - Total	___
___ SO_4	___ PO_4	___ BOD_5, COD, TOC	___
___ As, Ba, Cd, Cr, Pb, Hg, Se, Ag	___ Al, Co, Cu, Mo, Ni	___ Zinc	___
___ Sb, Be, Sr, Ti, Tl, V	___ Ca, Mg, Na, K	___ Chromium (Hex.)	___

Shipment Method & Carrier (if applicable): ______ Date sent: ______

Requested by: ______ Received by: ______ Date/Time: ______

Final Disposition of Sample(s) ______ Date: ______ By (Init.): ______

FIGURE 5

ENVIRONMENTAL SAMPLING DATA

(Use this space for mechanical imprint)

SAMPLING SITE IDENTIFIER (AFR 19-7)

BASE WHERE SAMPLE COLLECTED

SAMPLING SITE DESCRIPTION

DATE COLLECTION BEGAN (YYMMDD)

TIME COLLECTION BEGAN (24 hour clock)

COLLECTION METHOD ☐ GRAB ☐ COMPOSITE ______ HOURS

MAIL REPORTS TO (circle if changed)	
ORIGINAL	
COPY 1	
COPY 2	

SAMPLE COLLECTED BY (Name, Grade, AFSC)

SIGNATURE

AUTOVON

REASON FOR SUBMISSION

A-ACCIDENT/INCIDENT
R-ROUTINE/PERIODIC
C-COMPLAINT
N-NPDES
F-FOLLOWUP/CLEANUP
O-OTHER (specify)

BASE SAMPLE NUMBER

OEHL PID

ANALYSES REQUESTED (check appropriate blocks)

GROUP A	
Ammonia	00610
Chemical Oxygen Demand	00340
Kjeldahl Nitrogen	00625
Nitrate	00620
Nitrite	00615
Oil & Grease	00560
Organic Carbon	00680
Orthophosphate	00671
Phosphorus, Total	00665

GROUP D	
Cyanide, Total	00720
Cyanide, Free	00722

GROUP E	
Phenols	32730

GROUP F	
Antimony	01097
Arsenic	01002
Barium	01007
Beryllium	01012
Boron	01022
Cadmium	01027
Calcium	00916
Chromium, Total	01034
Chromium VI	01032
Copper	01042
Hardness	00900
Iron	01045
Lead	01051
Magnesium	00927
Manganese	01055
Mercury	71900
Nickel	01067
Potassium	00937
Selenium	01147
Silver	01077
Sodium	00929
Thallium	01059
Zinc	01092

GROUP G	
Acidity, Total	70508
Alkalinity, Total	00410
Alkalinity, Bicarbonate	00425
Bromide	71870
Carbon Dioxide	00405
Chloride	00940
Color	00080
Fluoride	00951
Iodide	71865
Odor	00086
Residue, Total	00500
Residue, Filterable (TDS)	70300
Residue, Nonfilterable	00530
Residue, Settleable	50086
Residue, Volatile	00505
Silica	00955
Specific Conductance	00095
Sulfate	00945
Sulfite	00740
Surfactants -MBAS	38260
Turbidity	00076

GROUP H	
BHC Isomers	39340
Chlordane	39350
DDT Isomers	39370
Dieldrin	39380
Endrin	39390
Heptachlor	39410
Heptachlor Epoxide	39420
Lindane	39782
Methoxychlor	39480
Toxaphene	39400
2,4-D	39730
2,4,5-TP-Silvex	39760
2,4,5-T	39740

GROUP J	
Sulfides	00745

GROUP T	
Bromoform	32104
Bromodichloromethane	32101
Carbon Tetrachloride	32102
Chloroform	32106
Chloromethane	34418
Dibromochloromethane	32105
Methylene Chloride	34423
Tetrachloroethylene	34475
1,1,1-Trichloroethane	34506
Trichloroethylene	39180
Trihalomethanes	82080
PCBs	39516

ON SITE ANALYSES

Parameter		Value
Flow	50050	mgd
Chlorine, Total	50060	mg/l
Dissolved Oxygen	00300	mg/l
pH	00400	units
Temperature	00010	°C

COMMENTS

AF FORM JAN 81 2752

FIGURE 6

12.3 Field Log Books

Bound Field Log Books will be maintained by the HART field team leader and other team members to provide a daily record of significant events, observations and measurement during the field investigation. All entries must be signed and dated.

All information, except drill logs, pertinent to the field survey and/or sampling will be recorded in the log books. These must be bound books, preferably with consecutively numbered pages that are at least 41/2 inches by 7 inches in size. Waterproof ink will be used in making all entries. Entries in the log book must include at least the following

- Name and title of author, date and time of entry, and physical/environmental conditions during field activity.
- Purpose of sampling activity
- Location of sampling activity
- Name and address of field contact
- Name and title of field crew
- Name and title of any site visitors
- Type of sampled media (e.g., soil, sediment, groundwater, etc.)
- Sample collection method
- Number and volume of sample(s) taken
- Description of sampling point(s)
- Date and time of collection
- Sample identification number(s)
- Sample distribution (e.g., laboratory)
- References for all maps and photographs of the sampling site(s)

- Field observations
- Any field measurements made, such as pH, water level, etc. All sample documentation such as:
- - Bottle lot numbers
- - Custody seal numbers
- - Dates and method of sample shipments
- - Chain of Custody Records
- All documentation for drums or other containers generated
  - Contents and approximate volume
  - Type and predicted level of contamination
  - Custody seal numbers
- Summary of daily tasks (including costs) and documentation on any cost or scope of work changes required by field conditions.

12.4 Corrections to Documentation

Unless prohibited by weather conditions, all original data recorded in Field Log Books, Sample Tags, and Chain-of-Custody Records, will be written with waterproof ink. None of these accountable serialized documents are to be destroyed or thrown away, even if they are illegible or contain inaccuracies that require a replacement document.

If an error is made on an accountable document assigned to one individual, that individual should make all corrections simply by crossing a line through the error and entering the correct information. The erroneous information should not be obliterated. Any subsequent error discovered on an accountable document should be corrected by the person who made the entry. All subsequent corrections must be initialed and dated.

12.5 Shipping of Samples

Samples will be delivered to the Princeton Testing Laboratory or to a OEHL for analysis as soon as practical after the number of samples and number of coolers is sufficient to comprise a shipment, preferably the same day the sample was taken. The sample will be accompanied by the Chain-of-Custody Record to Princeton Testing Laboratory and Chain-of-Custody Record and Form 2752 to OEHL.

13.0 SITE CLEAN-UP

Following the completion of the on-site remedial investigation at AFP, all sampling sites will be restored within reason to their pre-activity condition. All well and boring cuttings will be removed and the general area, following the completion of each well and boring, will be cleaned. New groundwater monitoring wells will be locked. Only those drill cuttings suspected of being hazardous waste (based on discoloration, odor and organic vapor detection instruments) will be properly containerized by HART for eventual disposal by AFP. The suspected hazardous waste shall be tested by HART for EP Toxicity and Ignitability.

All sampling and testing equipment will be decontaminated and removed from the site following completion of work.

14.0 FIELD TEAM ORGANIZATION AND RESPONSIBILITIES

14.1 Organization

The HART project field team will be organized according to the sampling activity. For on-site sampling work, the actual sampling team makeup will be dependent on the type and extent of sampling and will consist of a combination of the following:

- Project Manager
- Site Safety Officer
- Field Team Leader
- Geologists (1)
- Technician
- OVA Operator

Subcontractors will be used to provide crews and equipment for drilling, final well development and pump testing, geophysical logging and waste hauling. One individual may perform more than one of the functions listed above.

14.2 Responsibilities

Specific responsibilities for field team members are described below:

Project Manager: The HART Project Manager will be present at the beginning of field operations. He will brief the field team on the objectives of the sampling program and general procedures to be followed. In his absence from the site, the Field Team Leader will be his representative.

In the absence of Air Force field personnel, the Project Manager (or Field Team Leader) will direct all inquiries to the Air Force Project officer.

Site Safety Officer: The Site Safety Officer will be responsible for the adherence to all site safety requirements by the team members. The Safety Officer will assist in conducting site briefing meetings and will perform the final safety check. Additional responsibilities are:

- Updating equipment or procedures based upon new information gathered during the site inspection.

- Upgrading the levels of protection based upon site observations. Enforcing the "buddy system" where appropriate.

- Determining and posting locations and routes to medical facilities, including poison control centers; arranging for emergency transportation to medical facilities.

- Notifying local public emergency officers, i.e., police and fire departments, of the nature of the team's operations and posting their telephone numbers.

- Entering exclusion areas in emergencies when at least one other member of the field team is available to stay behind and notify emergency services; or after he/she has notified emergency services.

- Examining work party members for symptoms of exposure or stress.

- Providing emergency medical care and first aid as necessary on-site. The Safety Officer has the ultimate responsibility to stop any operation that threatens the health or safety of the team or surrounding populace.

Field Team Leader: The Field Team Leader will be responsible for the coordination of all sampling efforts, will assure the availability and maintenance of all sampling equipment and materials, and provide for shipping and packing materials. He will supervise the completion

of all Chain-of-Custody Records, the proper handling and shipping of the samples collected, be responsible for the accurate completion of Field Log Books and represent the Project Manager in his absence.

Geologist: The geologist will be responsible for directing drilling activities and installation of monitoring wells, including soil sampling, and initial development.

Technician: The Sample Preparation Technician will assume custody of samples to be shipped. He/she will be responsible for completing all Chain-of-Custody Forms. He/she will dispense sample containers, sample identification tags, etc., to the team members and retain records for control purposes.

OVA Operator: The OVA Operator will be responsible for performing all in-field OVA analyses of soil samples.

14.3 Training

Field personnel will be adequately trained with regard to hazardous waste site experience.

For site-specific training, field personnel will receive the Technical Operations Plan, Site Safety Plan and the Project Work Plan in a timely manner to allow for a sufficient review period. Prior to the initiation of site sampling, a field staff orientation and briefing will be held to acquaint personnel with the site, with the operation of any unfamiliar sampling equipment, and to assign field responsibilities.

All sampling activities will be based on, and will be in compliance with, the site Level of Protection classification, as described in the Site Safety Plan (Appendix A).

15.0 SCHEDULE

HART has scheduled the tasks described in this Technical Operations Plan to be completed as shown in Figure 7. While every reasonable effort will be made to meet these task deadlines, unexpected drilling conditions or weather events may require adjustment of this schedule.

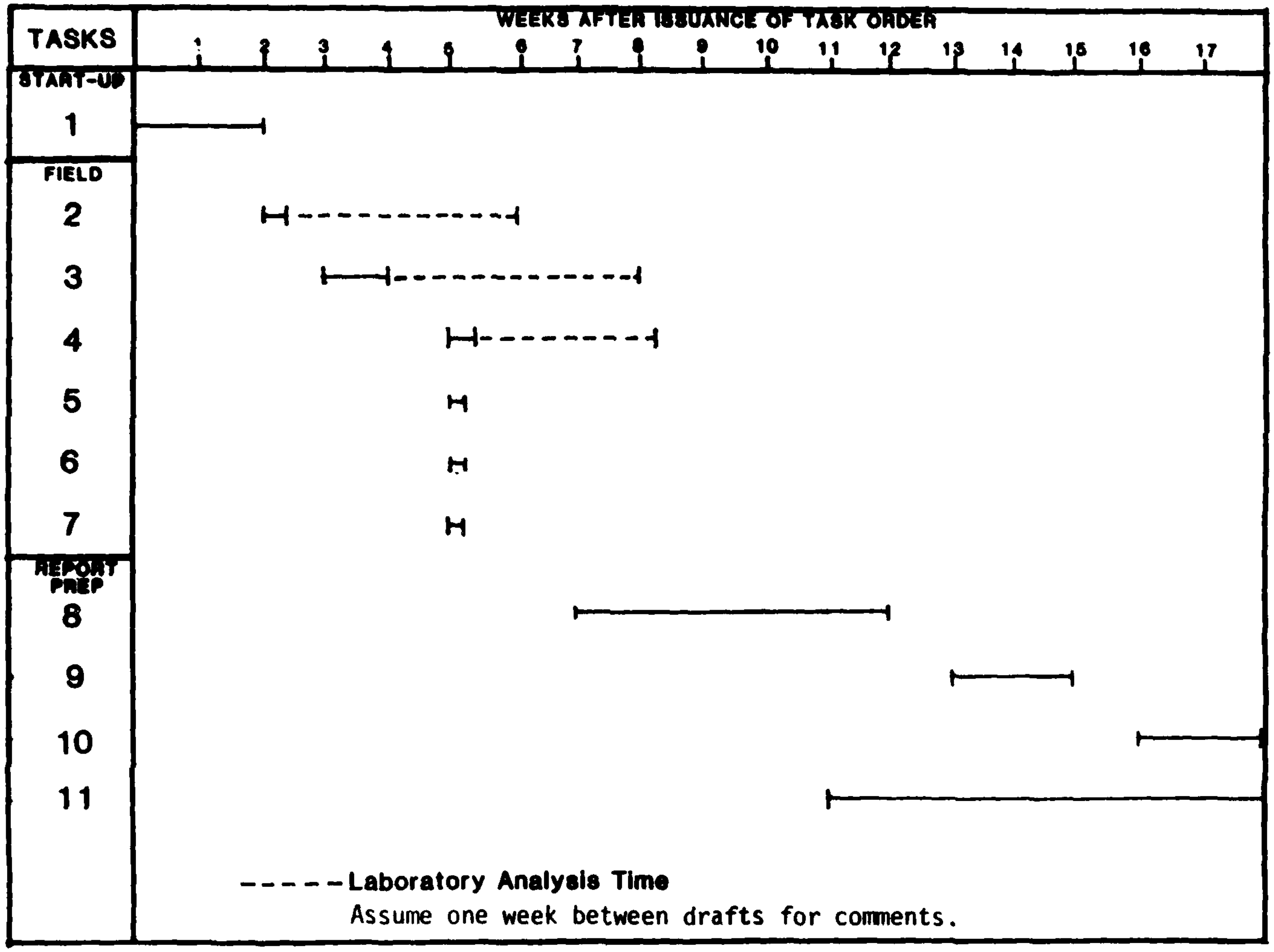


FIGURE 7 PROPOSED SCHEDULE

APPENDIX A

HEALTH AND SAFETY PLAN

(0076G)

PHASE II HEALTH & SAFETY PLAN

AFP 59

Johnson City, New York

Prepared by:

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(0221n)

1.0 Health and Safety Plan

This Health and Safety Program exists to protect employees from the hazards encountered during field investigations of uncontrolled hazardous waste sites. It is the result of experience gained from working on hazardous waste sites and handling hazardous materials, as well as consideration of all applicable government regulations and guidelines, and consultation with health and safety experts.

Personnel engaged in field investigations of hazardous waste storage, treatment, and disposal sites and remedial response activities encounter a wide variety of hazards, including potential exposure to toxic chemicals and radiation, fire and explosion hazards, and other physical hazards due to unstable, deteriorating structures. There is a great degree of uncertainty about an abandoned or uncontrolled site at all stages of an investigation, and there may always be a significant risk encountered at these sites.

This Health and Safety Program is intended to comply with Section 111(c) of CERCLA, EPA Orders 1440.1 and 1440.3, the Occupational Health and Safety Act (OSHA) of 1970, 5 U.S.C. 7902(c)(1).

1.1 Safety Considerations For Remedial Investigations

This section describes the administrative policies and procedures applicable to this remedial investigation.

Although the degree and type of hazard encountered by field teams varies greatly depending on the type of site (e.g. abandoned hazardous waste site or active facility) and the detail of field activity (e.g. preliminary site inspection or multimedia sampling), certain administrative policies and procedures must be adhered to. These include use of properly trained personnel, specific criteria for field team organization and size, site characterization to establish hazard level, proper selection, use and maintenance of personal protective equipment, and basic safety procedures.

1.2 Field Team Organization

A field team must be organized to efficiently and safely carry out the objectives of the project. These objectives may include such activities as sampling of hazardous wastes, monitoring well installation, site mapping, metal detection or performing geophysical surveys. The team will typically include individuals with many different technical skills, such as chemists, geologists, and engineers. In addition to performing its task objectives, the team must provide for its own safety to prevent injury or exposure to hazardous materials. This can be accomplished by assignment of specific roles and responsibilities to members of the field team and by assuring that the proper team size is used to effectively accomplish specific objectives.

There are a number of roles which are required for the safe and competent operation of a field investigation team. The four roles which are necessary at every site where a field team will be working are Project Manager, Field Team Leader, Equipment Specialist and the Work Party. Additional roles such as Command Post Supervisor, Personnel Decontamination Station Operator and an Emergency Response Team are added to the field team when the scope, magnitude, or hazard of the investigation justifies the need for them. A team member may take on more than one role, but the roles must be clearly assigned and must cover all those required rather than describe one team organization for all the different types of field investigations. Guidelines are presented here for assignment of responsibilities to team members to assure safety and for establishing the team size.

1.2.1 Project Manager. The Project Manager is responsible for the overall effectiveness of the field investigation. The specific responsibilities of the project manager include preparing and organizing all project work assignments, briefing team personnel on specific duties, obtaining site access permission from the owner or responsible party, ensuring that the health and safety requirements of the field team are complete and approved by the Health & Safety Director, preparing a Site Safety Plan, completing reports and maintaining the evidentiary file,

complying with chain-of-custody procedures, and coordinating with government representatives and subcontractors.

1.2.2 Field Team Leader. The Field Team Leader is accountable for the organization, operation, and safety of the field team. This role may be filled by the Project Manager. The Field Team Leader is responsible for proper field operations, maintaining a field notebook which records all site activities, completion of the objectives of the site Work Plan, compliance with document control procedures and proper field documentation of operating procedures, and determining the level of personal protection necessary to insure the health and safety of the field team. If subcontractors or outside observers are present, the Field Team Leader must enforce health and safety procedures.

1.2.3 Site Safety Officer. The Site Safety Officer has primary responsibility for all safety procedures and operations on-site. This role is usually filled by the Project Manager. The Site Safety Officer is responsible for upgrading, if necessary, the level of personal protection based upon observations and changing circumstances during the field investigation, enforcing the buddy system (personnel working in pairs); posting and briefing the field team of an approved safety plan which outlines locations, routes, and telephone numbers of the closest medical facilities and poison control centers; posting other emergency telephone numbers, such as the fire and police department and Health and Safety Director; and verifying that team members have met the health and safety requirements for field assignment. The Site Safety Officer has the authority to halt any operation that threatens the health or safety of the team.

1.2.4 Equipment Specialist. The Equipment Specialist is responsible for obtaining, inspecting, and maintaining all equipment in proper operating order. This requires specialized training in maintenance of equipment, such as self-contained breathing apparatus. The Equipment Specialist is responsible for preparing all sampling containers and equipment.

1.2.5 Work Party. The Work Party is ultimately responsible for the safe and successful completion of the work assignment. The members of the Work Party share many active and important functions which are necessary to fulfill the objectives of the investigation. These include setting up the personnel decontamination station, performing site hazard characterization, taking photographs, collecting samples of various media, decontaminating sample containers, packaging and shipping of the samples in accordance with chain-of-custody procedures, and decontaminating the entire Work Party prior to leaving the site.

1.3 Field Investigation Team Size

The size of an investigation team is determined by the hazard level of the investigation, the level of protection employed, the investigation, objectives, and the site characteristics and type. The team must be large enough to assure safety, but not so excessively large as to sacrifice economy.

1.3.1 Two-Person Team. A minimum of a two-person team consisting of HART, personnel will be used at the AFP 59 to collect environmental samples. A two-person team is appropriate for sites where extensive personal decontamination is not required and where the likelihood of emergency rescue is minimal. The two-person team is suitable when up to Level C protection is required. In the event of an emergency, the team member can summon outside assistance. Team responsibilities for the AFP 59 study are identified in the enclosed Site Safety Plan.

1.4 Selection, Use, and Maintenance of Personal Protective Equipment

Proper selection, use and maintenance of respiratory protective equipment and other personal protective equipment is extremely important in protecting the health and safety of field investigation personnel. An inadequate level of protection may result in unnecessary exposure to toxic

chemicals or other hazards. An excessively high level of protection may encumber field personnel unnecessarily and result in decreased efficiency, fatigue, and other hazards. Improper use or maintenance of protective equipment also exposes field personnel to unnecessary risks.

The site hazard assessment will be based on a site characterization obtained from previous site investigations. Once the site hazard assessment is completed, the Site Safety Officer will select the level of protection.

1.4.1 Respiratory Protection. The selection of adequate respiratory protection depends primarily on the type of hazardous substances to be encountered. Proper respirator use requires formal training and continued maintenance of the equipment, in accordance with 30 CFR Part 11 and provisions of the National Institute for Occupational Safety and Health. OSHA regulations pertaining to respiratory protection require a training program that encompasses user responsibilities, training for proper use, and respirator maintenance. OSHA also requires qualitative fit testing of face-pieces. Facial hair (beards) and wearing contact lenses is prohibited.

1.4.1.1 Air-Purifying Respirator (APR). The APR, which will be available to team members and may be used at the AFP 59, if necessary, removes contaminants from the atmosphere to some degree and can be used only in atmospheres containing sufficient oxygen to sustain life (in open air this is usually not a problem) and when other criteria, discussed below, are met.

Specific concentration limitations exist for specific devices. The chemical-cartridge respirator provides respiratory protection against certain gases and vapors in concentrations not in excess of that labelled on the cartridge. It can only be used in an area where minimal concentrations might occur and where SCBA has been determined unnecessary. Many types of cartridges are available and field personnel should select the appropriate one for the contaminants expected.

Air purifying respirators or cartridge respirators are worn when:

- Any unidentified and potentially hazardous odor is detected.
- Hazardous materials in the air are not greater than 10 times the permissible exposure limit (PEL), and have good warning properties.
- The Project Manager judges that respirators are needed as a precaution against generation of low levels of toxic substances in air due to sampling, handling, decontaminating, or other operations.
- The capacity of the cartridge will not be exceeded by extended periods of use on-site. (If used for extended periods, cartridges must be changed.)

Users of air purifying respirators must comply with the following:

- At least 19.5 percent oxygen must be present for respirator use, or unprotected breathing.
- Cartridge respirators do not supply oxygen. They are of no use in oxygen-deficient atmospheres.
- Air purifying respirators provide less protection than SCBAs and supplied air devices.
- Air purifying respirators must be NIOSH-approved.
- Cartridges also must be NIOSH-approved and should be matched to the respirator by the manufacturer.
- Cartridges must not be used past the expiration date.

- Air purifying respirators will provide adequate protection only if they have good face seals. A qualitative fit test is required for each employee using these respirators.

- Upon experiencing any warning property such as difficulty breathing, dizziness, or other distress, strong taste, or smell, the user must immediately leave the site. The Field Team Leader or Site Safety Officer may require that a user of an air purifying respirator carry an emergency escape air mask.

- Users of air purifying respirators must follow the manufacturer's instructions on the donning and use of the equipment.

- Cartridges must sometimes be replaced as often as each hour of use, or when the user senses or smells the vapor. If the contaminant of interest does not have warning properties, the APR cartridge must not be used.

1.4.2 <u>Protective Clothing</u>. Protective clothing must be worn by all personnel at hazardous waste sites to prevent skin exposure and to minimize spread of contamination. All on-site operations require protective clothing. Protective clothing may include, but is not limited to chemical-resistant pants and jackets or coveralls, disposable coveralls, steel toe and shank boots, protective gloves, hard hats, face shields or chemical safety glasses. Once adequate protective clothing is chosen, employees must also note that alertness is a significant safety factor. Since protective clothing is cumbersome, it hastens the on-set of fatigue and heat exhaustion, it can decrease alertness, and it limits staytime.

The following section describes Level D protective equipment which is appropriate for the AFP 59.

1.4.2.1 <u>Level D</u>. Level D is the basic work uniform and is used where significant exposure to hazardous materials is unlikely. Field personnel must not be permitted to work in civilian clothes.

Level D protection consists of:

- Coveralls, cotton
- Boots/shoes, safety, with steel toe and shank
- Safety glasses
- Hard hat with optional faceshield
- Gloves

Air-purifying respirators (previously described) with appropriate cartridges will be readily available at the site and will be used, if required, during excavation, drilling, sampling, decontamination or other operations.

1.5 Basic Safety Practice

Field personnel will observe basic safety practices. The Health and Safety Director will be responsible for informing all field personnel of these practices. They will include, but not be limited to, the following:

- Observe the buddy system (work in pairs)
- Eating, drinking, and smoking are prohibited on-site
- Alcohol consumption is prohibited 24 hours prior to and 24 hours after being on a hazardous waste site
- Contact lenses cannot be worn with any respirators
- Practice contamination avoidance by avoiding obvious contaminated objects/areas and by not sitting or kneeling on the ground
- Do not climb over drums or obstacles

* Maintain contact with the Site Safety Officer

1.6 Site Safety Plan

A written Site Safety Plan must be prepared prior to any field operation. The purpose of the form is to provide information about the site being investigated, an evaluation of the hazards present, and the plan developed to protect the field personnel and to prepare for emergency action. The plan is prepared by the Project Manager and submitted to the Health and Safety Director for review and approval prior to the operation.

A standard form is used for the Site Safety Plan which has five parts. The first part provides general information, including the name and location of the site and the objective(s) of the investigation. The second part provides information on the site and waste characteristics, including a description of the facility and its history. The third part of the form is a hazard evaluation, which assesses the potential hazards to site inspection personnel, based on available information. The fourth part of the form is the work plan itself. It establishes the work area, the personal protection (level of protection and equipment) to be used, decontamination procedures, site entry procedures, the site entry team members and their responsibilities, and work limitations. The last part of the form provides emergency information, including emergency contacts and resources, and emergency routes to hospitals or other facilities.

The Site Safety Plan must contain specific information describing the safety precautions and procedures to be used and justification for them. The hazard evaluation is a key part of the form, since the plan must be developed on the basis of the evaluation of known or potential hazards. If hazard information (e.g. possibility of explosive or toxic atmospheres) is not available, the safety plan must include a procedure for obtaining the necessary information or for protecting personnel from unknown but potential hazards.

1.6.1 <u>Reporting Incidents Involving Personal Injury or Exposure to Hazardous Materials</u>. All incidents involving personal injury or exposure to potentially hazardous materials during any field activity <u>must</u> be documented and reported immediately to the Health and Safety Director. A standardized incident report is used for this purpose.

It is important to report all exposures and injuries, even though the incident is not considered serious or no adverse health effects or symptoms are apparent at the time. Often exposure to a toxic agent may have delayed or latent effects which may only be detected by specific diagnostic tests. Documenting an exposure may aid in identifying the cause of symptoms or changes in health status indicators (diagnostic blood tests or pulmonary function, for example) at a later time. Likewise, an injury, such as an eye injury caused by dust particles, may result in delayed damage to the eye.

4.6.2 <u>Site-Specific Safety Plan</u>. The Site-Specific Safety Plan for the AFP 59 is detailed in Attachment 1. The safety plan provides information on site/waste characterizations, hazards, work plan, investigation-derived material disposal plan, and emergency/contingency information.

Level D protection will be adequate during all site activities including the sampling and corrective action activities. Investigation activities will be performed in Level D protection with constant Organic Vapor Analyzer (OVA) Model 128 monitoring to warn against the sudden release of volatile organics into the air. A sudden significant increase in volatile organic emmissions may require immediate withdrawal of site personnel and re-evaluation of protection levels. If OVA readings in excess of 100 ppm are obtained, the OVA will be run in the gas chromatography (GC) mode to estimate the percentages of methane and non-methane hydrocarbons. If non-methane hydrocarbons exceed 10 ppm at any location, personnel will don air-purifying respirators with organic vapor and acid gas cartridges. Additionally, monitoring for the presence of sulfuric acid will be conducted with Draeger tubes. Soil and

water samples obtained during the field investigation will be collected with PVC or neoprene gloves.

Field investigations and sampling activities can result in the generation of contaminated materials. Proper presampling planning must include a management plan for the disposal of materials encountered during field investigations in order to minimize the impact to the environment and the risk to public health. The contaminated materials that will be generated include decontamination rinse water and used disposable clothing. Disposable clothing and rinse water will be disposed of on the site.

ATTACHMENT A

SITE SAFETY PLAN

SITE SAFETY PLAN

A. GENERAL INFORMATION

SITE: Air Force Plant 59 PROJECT NO.: G106

LOCATION: Johnson City, NY

PREPARED BY: Rebekah Dunn DATE: 12/3/85

APPROVED BY: Francie Barker DATE: 12/3/85

OBJECTIVE(S): Conduct sampling for remedial investigation to identify extent and magnitude of contaminated soil and groundwater.

PROPOSED DATE(S) OF INVESTIGATION: Summer 1986

BACKGROUND REVIEW: COMPLETE: X PRELIMINARY:

DOCUMENTATION/SUMMARY: OVERALL HAZARD: SERIOUS

MODERATE

LOW X

UNKNOWN

B. SITE/WASTE CHARACTERISTICS

WASTE TYPE(S): LIQUID X SOLID SLUDGE GAS

CHARACTERISTIC(S): CORROSIVE IGNITABLE X RADIOACTIVE

VOLATILE X TOXIC X REACTIVE UNKNOWN OTHER (NAME):

FACILITY DESCRIPTION: AF 59 is an Air Force owned electro-mechanical systems production facility operated by General Electric Company.

PRINCIPAL DISPOSAL METHOD (type and location): Storage of hazardous waste off-site by contractors.

UNUSUAL FEATURES (dike integrity, power lines, terrain, etc.) None presently known, will be determined on site.

STATUS (active, inactive, unknown): Active

HISTORY (worker or nonworker injury; compliants from public; previous agency action): No history

C. HAZARD EVALUATION

There is potential for dermal exposure to soils contaminated with waste oils, degreasers, process chemicals, and paint residues during soil sampling. In addition ambient air concentrations of volatile organics may be exacerberated during drilling if drilling occurs in contaminated areas.

D. SITE SAFETY WORK PLAN

PERIMETER ESTABLISHMENT: MAP/SKETCH ATTACHED See Fig. 2 Tech. Operation Plan SITE SECURED? Yes

PERIMETER IDENTIFIED ZONE(S) IF CONTAINMENT IDENTIFIED Yes

PERSONNEL PROTECTION

LEVEL OF PROTECTION: A B C D X

MODIFICATIONS:

During drilling, upgrade to Level C if non-methane hydrocarbons exceed 5-10 ppm above background.

SURVEILLANCE EQUIPMENT AND MATERIALS:

Organic Vapor Analyzer

DECONTAMINATION PROCEDURES: Washing boots, gloves, split spoons, all sampling equipment rinse with determent and water, rinse with clean water, methanol rinse, then distilled water. Steam cleaning of drilling equipment.

SPECIAL EQUIPMENT, FACILITIES, OR PROCEDURES:

Decon waste will be drummed for proper disposal.

SITE ENTRY PROCEDURES: N/A

TEAM MEMBER (Major)	RESPONSIBILITY
Jim Mack	Project Director
Robert Goldman	Field Team Leader/QA/QC/ Site Safety/Hydrogeology
Aaron Levy	Field Technician

WORK LIMITATIONS (time of day, etc.): Daylight hours

INVESTIGATION-DERIVED MATERIAL DISPOSAL: Disposable clothes and equipment to be bagged and disposed of as waste, unless contaminated, when it will be drummed and disposed of by AFB off-site.

E. EMERGENCY INFORMATION

LOCAL RESOURCES

AMBULANCE: (607) 772-1010

HOSPITAL EMERGENCY ROCM: (607) 770-6611

POISON CONTROL CENTER: (607) 770-6611

POLICE: (607) 729-9321

FIRE DEPARTMENT: (607) 729-9512

AIRPORT: (607) 798-7171

EXPLOSIVES UNIT: None

~~EPA~~ CONTACT: Mr. Patrick Gilligan (607) 770-2216
USAF

SITE RESOURCES

WATER SUPPLY: At Plant

TELEPHONE: (607) 770-2216

RADIO: N/A

OTHER: N/A

EMERGENCY CONTACTS

CORPORATE SAFETY DIRECTOR	Laurence Kaufman, Ph.D.	(202) 296-7902
PROJECT LEADER	Jim Mack	(212) 840-3990
FCHA OFFICE		(212) 840-3990

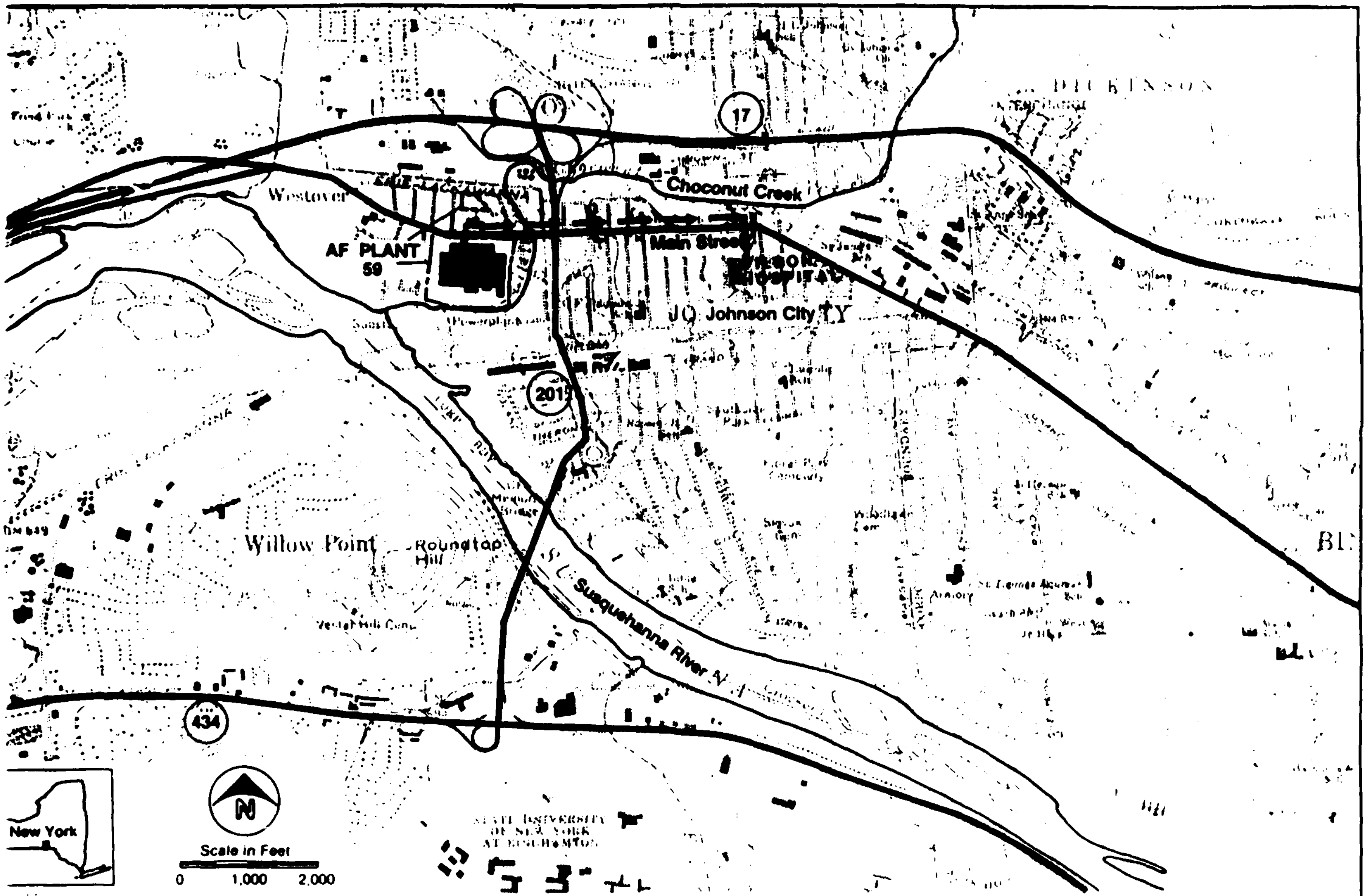
F. EMERGENCY ROUTES

(give road or other directions; attach map)

HOSPITAL:

Turn east on Main Street from plant exit, proceed 3/4 mile. Wilson Hospital is located on south side of road.

OTHER:



Location and Vicinity Map of AF Plant 59